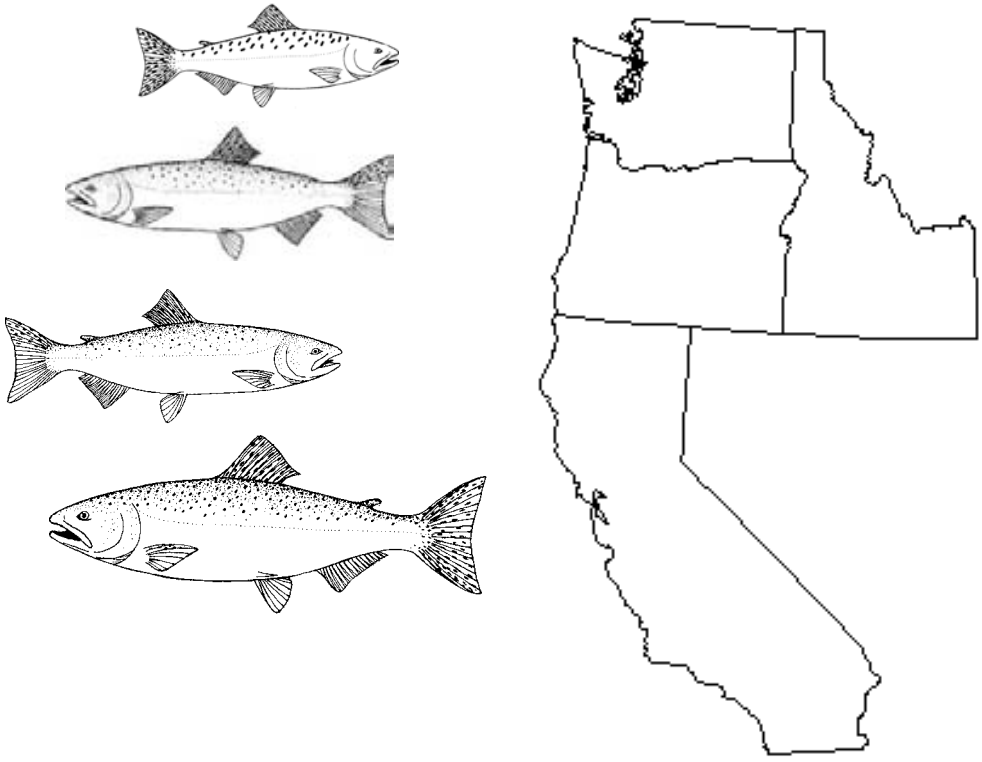
PRESEASON REPORT I

STOCK ABUNDANCE ANALYSIS FOR 2005 OCEAN SALMON FISHERIES



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LIST OF ACRONYMS AND ABBREVIATIONS

BY	brood year
CDFG	California Department of Fish and Game
CoTC	Coho Technical Committee (of the PSC)
Council	Pacific Fishery Management Council
CRFMP	Columbia River Fishery Management Plan
CVI	Central Valley Index
CWT	coded-wire tag
EEZ	exclusive economic zone (from 3-200 miles from shore)
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FMP	fishery management plan
FRAM	Fishery Regulatory Assessment Model
ISBM	individual stock-based management
Jack CR	Columbia River jacks
Jack OC	Oregon coastal and Klamath River Basin jacks
KMZ	Klamath management zone (ocean zone between Humbug Mountain and Horse Mountain where management emphasis is on Klamath River fall chinook)
LRB	lower river bright
LRH	lower Columbia River hatchery (tule fall chinook returning to hatcheries below Bonneville Dam)
LRW	lower Columbia River wild (bright fall chinook spawning naturally in tributaries below Bonneville Dam)
MCB	mid-Columbia River brights (bright hatchery fall chinook released below McNary Dam)
MOC	mid-Oregon coast
MSY	maximum sustainable yield
NA	not available
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOC	north Oregon coast
OCN	Oregon coastal natural (coho)
OCNL	Oregon coastal natural lake
OCNR	Oregon coastal natural river
ODFW	Oregon Department of Fish and Wildlife
OPI	Oregon Production Index (coho salmon stock index south of Leadbetter Point)
OPIH	Oregon Production Index public hatchery
PRIH	Private hatchery
PSC	Pacific Salmon Commission
PST	Pacific Salmon Treaty
RER	rebuilding exploitation rate
RK	Rogue/Klamath (coho)
RMP	Resource Management Plan (for exemption from ESA section 9 take prohibitions under limit 6 of the 4(d) rule)
SAB	Select Area brights
SCH	Spring Creek Hatchery (tule fall chinook returning to Spring Creek Hatchery)
SRS	Stratified Random Sampling
STEP	Salmon Trout Enhancement Program
STT	Salmon Technical Team (formerly the Salmon Plan Development Team)
URB	upper river brights (naturally spawning bright fall chinook normally migrating past McNary Dam)
VSI	visual stock identification
WCVI	West Coast Vancouver Island
WDFW	Washington Department of Fish and Wildlife

INTRODUCTION

This is the second report in an annual series of four reports prepared by the Salmon Technical Team (STT) of the Pacific Fishery Management Council (Council) to document and help guide salmon fishery management off the coasts of Washington, Oregon, and California. This report will be formally reviewed at the Council's March meeting. The third and fourth reports in this series will be developed at the close of the March and April Council meetings, respectively, to analyze the impacts of the Council's proposed and final ocean salmon fishery management recommendations for 2005.

This report provides 2005 salmon stock abundance projections, and an analysis of the impacts of 2004 regulations, or regulatory procedures, on the projected 2005 abundance. This analysis is analogous to that of a no-action alternative in a National Environmental Policy Act (NEPA) analysis, and is intended to give perspective in developing 2005 management measures. The report focuses on chinook and coho stocks that have been important in determining Council fisheries in recent years and on stocks listed under the Endangered Species Act (ESA) with established National Marine Fisheries Service (NMFS) ESA consultation standards.

Chapter I provides a summary of stock abundance projections. Chapters II and III provide detailed stock-by-stock analyses of abundance, a description of prediction methodologies, and accuracy of past abundance predictions for chinook and coho salmon, respectively. Chapter IV summarizes abundance information for pink salmon. Three appendices provide supplementary information as follows: Appendix A provides a summary of Council stock management goals; Appendix B contains pertinent data for Oregon production index (OPI) area coho; Appendix C contains the Council's current harvest allocation schedules.

In 2002, the Pacific Salmon Commission (PSC) reached agreement on a management regime that constrains total fishery exploitation rates on key management units of naturally spawning coho salmon originating in Southern British Columbia, Puget Sound, and the Washington Coast. The agreement calls for the PSC Coho Technical Committee (CoTC) to develop a regional coho fishery planning model for application beginning in 2004. The CoTC has agreed to use Coho Fishery Regulation Assessment Model (FRAM) as the core for an initial version of the regional coho fishery planning model to provide a consistent basis for fishery planning processes in the United States and Canada.

The chinook fishery planning tools employed by the PSC and the Council are based on coded-wire tag (CWT) recovery data from the late 1970's to early 1980's. During this period, the predominant West Coast Vancouver Island (WCVI) troll harvest of chinook occurred from May through September. In recent years, Canada has conducted its chinook troll fishery off the WCVI in a much different pattern so as to minimize impacts on stocks of domestic conservation concern, particularly WCVI fall chinook and Interior Fraser (Thompson River) coho. Changes include the use of a smaller size limit (55 cm), taking the vast majority of chinook harvest from October to June, and dynamic inseason management to minimize impacts on WCVI chinook and Thompson River coho based on results of DNA sampling. The quality of impact projections of the WCVI troll fishery using existing chinook models becomes more uncertain as the magnitude of the harvest taken under these new fishing patterns increases. However, the available information on the stock and age composition of the WCVI chinook troll harvest under these recent fishing patterns does not form an adequate basis for modifying the Council's methods for preseason planning of chinook fisheries in 2005.

CHAPTER I
ABUNDANCE PROJECTIONS

ABUNDANCE PROJECTIONS

Abundance expectations in 2005 are summarized for key chinook and coho salmon stocks in Tables I-1 and I-2, respectively. Information on pink salmon abundance, which is only significant in odd-numbered years, is contained in Chapter IV. Council Salmon Fishery Management Plan (FMP) management goals are presented in Table 1-3 and Appendix A, Table A-1.

In addition to the key stocks with abundance projections listed in Tables I-1 and I-2, Council management decisions for the 2005 ocean salmon fishing seasons may be constrained by other stocks, such as those listed under the ESA or subject to the PSC agreement, which may not have abundance projections made, or do not have abundance projections available in time for inclusion in this report. These include Sacramento River winter, Central Valley spring, California coastal, lower Columbia River, and Snake River fall chinook; and central California, southern Oregon/northern California, and Interior Fraser (Thompson River) coho.

TABLE I-1. Preseason **adult chinook** salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group	Preseason Estimates of Adults 1998	1999	2000	2001	2002	2003	2004	2005	Methodology for 2005 Prediction and Source
California Central Valley (Index) Sacramento and San Joaquin Basins, Fall, Late Fall, Spring, and Winter Run	1,051.0	847.7	790.4	649.4	825.4	1,108.1	831.8	1,678.3	Linear regression analysis of river age-2 jacks on CVI of the following year. CDFG.
Klamath River (Ocean Abundance) Fall Run	225.2	165.5	389.8	435.4	362.5	310.2	216.3	239.7	Linear regression analysis of age-specific ocean abundance estimates on river runs of same cohort. KRTAT.
Oregon Coast									
North and South/Local Migrating	Preseason Estimates not Made								None.
Columbia River (Ocean Escapement)									
Upriver Spring	36.2	24.6	134.0	364.6	333.7	145.4	360.7	254.1	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Willamette Spring	32.8	46.0	59.9	61.0	73.8	109.8	109.4	116.9	Age-specific linear regressions of cohort returns in previous run years. ODFW staff.
Sandy Spring	3.9	4.3	3.8	4.0	4.3	4.8	5.2	7.4	Recent year average. ODFW staff.
Cowlitz Spring	1.5	2.1	2.0	1.0	3.1	4.9	15.9	12.7	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Kalama Spring	0.5	0.3	1.4	1.0	1.6	3.6	6.0	4.5	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Lewis Spring	0.9	1.5	2.6	2.8	2.0	3.1	5.4	7.6	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Upriver Summer	17.3	16.5	33.3	24.5	77.7	87.6	102.8	62.4	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
URB Fall	150.8	147.5	171.1	127.2	281.0	280.4	292.2	351.0	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
SCH Fall	14.2	65.8	21.9	56.6	144.4	96.9	138.0	113.8	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
LRW Fall	8.1	2.6	3.5	16.7	18.7	24.6	24.1	20.2	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
LRH Fall	19.2	34.8	23.7	32.2	137.6	115.9	77.1	74.1	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
MCB Fall	47.8	38.3	50.6	43.5	96.2	104.8	90.4	89.4	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
Washington Coast (Ocean Escapement)									
Willapa Bay Natural	-	4.2	4.2	4.3	3.7	2.4	4.1	3.2	
Hatchery	64.5	15.5	18.9	17.8	18.8	14.2	14.7	17.4	Mean return per release by age class. WDFW staff.
Other Coastal Stocks	---------- Not Available----------								WDFW and tribes.

TABLE I-1. Preseason **adult chinook** salmon stock forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults 1998	1999	2000	2001	2002	2003	2004	2005	Methodology for 2005 Prediction and Source
Puget Sound[a/]										WDFW and tribes.
Nooksack/Samish Hatchery		28.0	27.0	19.0	34.9	52.8	45.8	34.2	19.5	Brood release times average return-at-age/release. Last two years' R/S to fingerling release
East Sound Bay	Hatchery	0.5	2.3	5.0	1.6	1.6	1.6	0.8	0.4	1991-2000 average return rate of Nooksack/Samish fall chinook multiplied by 2001 Glenwood brood release.
Skagit	Natural	6.6	7.6	7.3	9.1	13.8	13.7[b/]	20.4[b/]	23.4[b/]	Age specific average cohort rates. 1987-2000 BY for average at age return
	Hatchery	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	Average return/smolt for BYs 1985-1999 broods multiplied by brood year 2001 release.
Stillaguamish	Natural	1.6	1.5	2.0[c/]	1.7[c/]	2.0[c/]	2.0[c/]	3.3[c/]	2.0[c/]	Estimate based on spawner-recruit information.
Snohomish	Natural	5.6	5.6	6.0	5.8[c/]	6.7[c/]	5.5[c/]	15.7[c/]	14.2[c/]	Estimates based on spawner-recruit information.
	Hatchery	6.5	7.8	6.2	4.1	6.8[c/]	9.4[c/]	10.1[c/]	9.9[c/]	Age specific forecast for fingerling and yearling for BYs 2000-2003 times estimated survival rates.
Tulalip Hatchery		2.5	4.5	5.0	5.5	5.8[c/]	6.0[c/]	7.6[c/]	9.2[c/]	CWT survival rates multiplied by release numbers for brood years 2001-2003.
South Puget Sound	Natural	21.8	19.6	17.5	16.2	16.9	19.6	17.5	17.7	Puyallup-predicted return at age calculated for return years 1992-2003. For Nisqually, 2001 escapement times 1997-2002 mean return/spawner.
	Hatchery	67.8	59.4	77.5	73.7	90.8	86.6	86.5	41.8	Average return at age multiplied by cohort release for Green, McAllister (minus 3-year-olds), and 10E. Average of two different methods for Carr Inlet, (1) 1980-2003 mean return/smolt released multiplied by 2001 brood smolts released, and (2) 1980-2003 mean return/pound released multiplied by 2001 brood pounds released.
Hood Canal	Natural and Hatchery	6.7	14.0	19.2	2.7 22.6	2.9[b/] 21.1[b/]	3.6[b/] 30.2[b/]	2.4[b/] 27.2[b/]	3.1[b/] 27.5[b/]	Product of 2001 brood fingerling release times average. Postseason estimated terminal return rates.
Strait of Juan de Fuca	Natural	0.9	0.9	1.1	3.5	3.6[b/]	3.4[b/]	3.6[b/]	4.2[b/]	Four year average 2001-2004 of terminal run size. Elwha estimate is a combination of hatchery and wild fish.
	Hatchery	1.7	1.9	2.0	0.0	0.0	0.0	0.0	0.0	

a/ Forecast is Puget Sound run size available to U.S. net fisheries. Does not include fish caught in troll and recreational fisheries.
b/ Terminal run forecast.
c/ Expected spawning escapement without fishing.

TABLE I-2. Preliminary preseason **adult coho** salmon stock ocean abundance forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults 1998	1999	2000	2001	2002	2003	2004	2005	Methodology for 2005 Prediction
OPI Area (Total Abundance) (California and Oregon Coasts and Columbia River)		165.8	620.6	727.9	1,758.7	434.1	984.6	777.9	542.9	Sum of stock component estimates.
OPI Public Hatchery		118.4	559.2	671.4	1,707.6	361.7	863.1	623.9	389.9	Multiple linear regression of OPI public hatchery jacks to adults adjusted for Columbia River delayed smolt release; 1970-2004 SRS accounting database. Public hatchery prediction is partitioned into Columbia River early and late, and coastal stocks based on the percent of jacks observed and recent year average stock specific maturation rates.
Columbia River Early		63.8	325.5	326.3	1,036.5	161.6	440.0	313.6	284.6	
Columbia River Late		24.9	140.9	278.0	491.8	143.5	377.9	274.7	78.0	
Coastal N. of Cape Blanco		21.6	59.4	48.5	127.3	36.6	29.3	16.6	11.5	
Coastal S. of Cape Blanco		8.1	33.4	18.6	52.0	20.0	15.9	19.0	15.8	
OCN		47.2	60.7	55.9	50.1	71.8	117.9	150.9	152.0	For river production, relates ocean recruits (SRS accounting) to upwelling, sea surface temperature; data base 1970-2004. Most recent three-year average abundance for lake production.
STEP		0.2	0.7	0.6	1.0	0.6	3.6	3.1	1.0	Smolt production from 2002 brood year with 2001 brood year observed smolt to adult survival rate.
Washington Coast										A variety of methods were used for 2005, primarily based on smolt production and survival. See text in Chapter III for details.
Willapa	Natural	3.3	8.3	9.9	21.6	21.6	31.8	36.7	35.9	
	Hatchery	20.8	40.5	19.6	36.1	40.4	57.5	55.0	56.4	
Grays Harbor	Natural	30.1	57.7	47.8	51.3	55.4	58.0	117.9	91.1	
	Hatchery	25.6	30.4	75.8	67.1	56.8	64.0	67.8	54.4	
Quinault	Natural	6.5	7.3	4.4	8.7	29.4	47.7	50.5	44.9	
	Hatchery	3.9	8.2	7.4	10.8	12.3	20.6	18.2	33.6	
Queets	Natural	4.2	4.3	2.7	12.0	12.5	24.0	18.5	17.1	
	Hatchery	4.6	13.8	11.8	10.0	16.0	24.9	17.1	17.4	
	Supplemental	0.7	3.0	0.8	NA (Flood)	2.0	1.3	2.5	2.4	
Hoh	Natural	3.4	3.2	3.5	8.5	8.5	12.5	8.1	7.6	
Quillayute Fall	Natural	8.0	14.5	8.7	23.0	22.3	24.9	21.2	18.6	
	Hatchery	4.4	9.4	13.9	15.3	15.0	15.2	20.9	22.1	
Quillayute Summer	Natural	1.3	1.2	1.6	0.6	1.2	1.8	1.1	0.8	
	Hatchery	1.8	3.5	5.4	5.3	4.9	5.4	6.1	6.1	
North Coast Independent Tributaries	Natural	3.0	3.4	5.1	8.1	6.4	14.8	12.7	8.5	
	Hatchery	3.0	5.8	11.7	8.1	8.1	11.0	4.3	5.6	
WA Coast Total	Natural	59.8	99.9	83.7	133.8	157.3	215.5	266.7	224.5	
	Hatchery	64.8	114.6	146.4	152.7	155.5	199.9	191.9	198.0	

TABLE I-2. Preliminary preseason **adult coho** salmon stock ocean abundance forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults 1998	1999	2000	2001	2002	2003	2004	2005	Methodology for 2005 Prediction
Puget Sound										A variety of methods were used for 2005, primarily based on smolt production and survival. See text in Chapter III and Joint WDFW and tribal annual reports on Puget Sound Coho Salmon Forecast Methodology for details.
Strait of Juan de Fuca	Natural	16.8	14.7	13.5	21.4	21.2	20.1	35.7	20.7	
	Hatchery	28.3	37.7	13.6	14.4	14.0[b/]	24.0[b/]	28.7[a/]	26.5[b/]	
Nooksack-Samish	Natural	30.8	13.8	14.9	12.4	22.0	16.4	27.5	17.0	
	Hatchery	119.1	95.0	65.5	44.4	105.4	66.2	75.5	89.5	
Skagit	Natural	55.0	75.7	30.2	87.2	98.5	116.6	155.8	61.8	
	Hatchery	12.9	10.9	10.3	10.1	14.1	10.4	22.8	9.1	
Stillaguamish	Natural	47.8	35.7	17.7	24.4	19.7	37.8	38.0	56.7	
	Hatchery	-	-	-	-	-	1.3	0.5	0.2	
Snohomish	Natural	165.3	141.6	53.0	129.6	123.1	203.0	192.1	241.6	
	Hatchery	47.1	87.8	62.1	60.9	60.3	35.4	48.3	59.1	
South Sound	Natural	57.2	19.4	11.7	29.5	40.4	103.6	61.3	45.7	
	Hatchery	408.7	372.1	121.8	172.6	222.5	315.6	288.4	222.2	
Hood Canal	Natural	108.0	65.1	61.0	62.0	34.9	32.4	98.7	98.4	
	Hatchery	95.2	96.8	38.5	33.5	31.3[b/]	48.0[b/]	43.1[b/]	60.6[b/]	
Puget Sound Total	Natural	480.9	366.0	202.0	366.5	359.8	529.9	609.2	543.9	
	Hatchery	711.3	700.3	311.8	335.9	447.6	501.0	507.3	465.2	

a/ Strait of Juan de Fuca and Hood Canal Hatchery numbers in 2002-2005 include natural coho from secondary (hatchery) management zones.

TABLE I-3. Achievement of **conservation objectives** for natural stocks listed in Table 3-1 of the Pacific Coast Salmon Plan. Bolded numbers indicate a failure to meet the conservation objective. Stocks listed under the Endangered Species Act are not included. (Page 1 of 2)

Stock and Conservation Objective (thousands of spawners; spawners per mile; impact or replacement rate)	**Observed or Projected Conservation Achievement** (postseason estimates of thousands of spawners or spawners per mile; preseason or postseason impact or replacement rate)									**Overfishing Criteria**		
	1997	1998	1999	2000	2001	2002	2003	2004[a/]	2005[b/]	Alert[c/]	Concern[d/]	Exception[e/]
CHINOOK												
Sacramento River Fall 122.0 - 180.0 adult spawners	342.9	238.1	386.8	413.8	544.9	775.5	521.2	283.1	>180.0	No	No	No
Klamath River Fall - no less than 35.0 adult natural spawners	46.1	42.5	**18.5**	82.7	77.8	65.6	87.1	**24.2**	**<35.0**	**Yes**	No	No
Southern, Central and Northern Oregon Coast Spring and Fall No less than 60 adult spawners/mile[f/]	93.3	87.7	104.4	76.4	165.2	222.4	235.9	175.5	>60.0	No	No	No
Upper Columbia River Bright Fall 43.5 adults over McNary Dam Council area base period impacts <4%	67.1	63.8	78.4	66.4	110.5	141.6	173.7	168.9	>43.5	No	No	Exp. Rate
Columbia River Summer Chinook 80.0 to 90.0 adults over Bonneville Dam Council area base period impacts <2%	**27.9**	**21.4**	**26.2**	**30.6**	**76.2**	127.4	114.8	>80.0	>80.0	No	No	Exp. Rate
In 2004 state and tribal co-managers changed the stock definition from chinook passing Bonneville Dam after May 31 to chinook passing Bonneville Dam after June 14, and the goal changed to 29,000 at the river mouth	**12.3**	**18.3**	**16.3**	**22.3**	**23.2**	54.9	92.8	83.1	65.4	No	No	Exp. Rate
Grays Harbor Fall - 14.6 adult spawners (MSP)	18.2	**12.5**	**10.4**	**9.3**	**9.5**	**11.3**	19.4	NA[g/]	NA[g/]	No	No	Exp. Rate
Grays Harbor Spring - 1.4 adult spawners	4.5	2.3	1.3	2.9	2.9	2.6	1.9	NA[g/]	NA[g/]	No	No	Exp. Rate
Queets Fall - no less than 2.5 adult spawners (MSY)	2.5	4.0	**1.9**	3.6	2.9	**1.9**	5.0	3.5	NA[g/]	No	No	Exp. Rate
Queets Spring/Summer - no less than 0.7 adult spawners	**0.54**	**0.49**	**0.37**	**0.25**	**0.55**	0.74	**0.19**	**0.60**	NA[g/]	Limited[e/]	No	Exp. Rate
Hoh Fall - no less than 1.2 adult spawners (MSY)	1.8	4.3	1.9	1.7	2.6	4.4	1.6	1.8	NA[g/]	No	No	Exp. Rate
Hoh Spring/Summer - no less than 0.9 adult spawners	1.8	1.3	0.9	**0.5**	1.2	2.5	1.2	1.8	NA[g/]	No	No	Exp. Rate
Quillayute Fall - no less than 3.0 adult spawners (MSY)	5.4	6.8	3.3	3.7	5.1	6.1	7.4	3.6	NA[g/]	No	No	Exp. Rate
Quillayute Spring/Summer - 1.2 adult spawners (MSY)	**0.9**	1.6	**0.7**	**1.0**	1.2	**1.0**	1.2	**0.7**	NA[g/]	Limited[f/]	No	Exp. Rate

TABLE I-3. Achievement of **conservation objectives** for natural stocks listed in Table 3-1 of the Pacific Coast Salmon Plan. Bolded numbers indicate a failure to meet the conservation objective. Stocks listed under the Endangered Species Act are not included. (Page 2 of 2)

Stock and Conservation Objective (thousands of spawners; spawners per mile; impact or replacement rate)	**Observed or Projected Conservation Achievement** (postseason estimates of thousands of spawners or spawners per mile; preseason or postseason impact or replacement rate)									**Overfishing Criteria**		
	1997	1998	1999	2000	2001	2002	2003	2004[a/]	2005[b/]	Alert[c/]	Concern[d/]	Exception[e/]
COHO												
Grays Harbor - 35.4 adult spawners (MSP)	**22.5**	35.6	**33.3**	37.1	79.1	110.7	107.3	64.7	>35.4	No	No	No
Queets - 5.8 to 14.5 adult spawners (MSY range) Includes supplemental adults	**1.9**	**5.5**	**5.3**	8.6	24.9	14.8	9.3	10.8	>5.8	No	No	No
Hoh - 2.0 to 5.0 adult spawners (MSY range)	**1.4**	4.4	4.6	6.8	10.8	9.0	6.3	2.1	>2.0	No	No	No
Quillayute Fall - 6.3 to 15.8 adult spawners (MSY range)	**4.6**	13.9	9.4	13.3	18.9	23.0	14.8	10.7	>6.3	No	No	No
Western Strait of Juan de Fuca - 11.9 adult spawners	**4.1**	15.1	**8.0**	16.9	34.3	20.6	12.4	>11.9	>11.9	No	No	No
Eastern Strait of Juan de Fuca - 0.95 adult spawners	1.30	1.94	1.36	2.11	2.6	2.5	2.9	>0.95	>0.95	No	No	No
Hood Canal - 21.5 adult spawners (MSP)	95.8	101.1	**16.6**	27.3	94.7	69.3	170.3	>21.5	>21.5	No	No	No
Skagit - 30.0 adult spawners (MSP)	23.4	73.7	**27.3**	62.9	87.0	56.0	69.2	>30.0	>30.0	No	No	No
Stillaguamish - 17.0 adult spawners (MSP)	**10.9**	27.3	**7.0**	28.3	73.6	27.3	45.7	59.2	>17.0	No	No	No
Snohomish - 70.0 adult spawners (MSP)	**58.2**	150.1	**61.3**	94.2	261.8	161.6	182.7	>70.0	>70.0	No	No	No

a/ Preliminary data.

b/ Preliminary approximations based on preseason abundance projections and last year's regulations or season structures.

c/ **Conservation Alert** - triggered during the annual preseason process if a natural stock or stock complex, listed in Table 3-1 of the salmon FMP, is projected to fall short of its conservation objective (MSY, MSY proxy, MSP, or floor in the case of some harvest rate objectives [e.g., 35,000 natural Klamath River fall chinook spawners]).
Actions for Stocks that are not Exceptions (beginning in 2001) - The Council will close salmon fisheries within its jurisdiction which impact the stocks, except in the case of Washington coastal and Puget Sound salmon stocks and fisheries managed under U.S. District Court orders. In these cases, the Council may allow fisheries which meet annual spawner targets developed through relevant U.S. v. Washington, Hoh v. Baldrige, and subsequent U.S. District Court ordered processes and plans, that may vary from the MSY or MSP conservation objectives. For all natural stocks that meet the conservation alert criteria, the Council will notify pertinent fishery and habitat managers, advising that the stock may be temporarily depressed or approaching an overfishing concern (depending on its recent conservation status), and request state and tribal fishery managers identify the probable causes, if known. If the stock in question has not met its conservation objective in the previous two years, the Council will request state and tribal managers to do a formal assessment of the primary factors leading to the shortfalls and report their conclusions and recommendations to the Council no later than the March meeting prior to the next salmon season.

d/ **Overfishing concern** - triggered if, in three consecutive years, the postseason estimates indicate a natural stock, listed in Table 3-1 of the salmon FMP, has fallen short of its conservation objective (MSY, MSP, or spawner floor as noted for some harvest rate objectives).
Actions required for Stocks that are not Exceptions - Within one year, the STT to recommend and the Council to adopt management measures to end the overfishing concern and recover the stock in as short a time as possible, preferably within ten years or less. The HC to provide recommendations for habitat restoration and enhancement measures within a suitable time frame.

e/ **Exception** - strict application of the conservation alert and overfishing criteria and subsequent Council actions do not apply for (1) hatchery stocks, (2) natural stocks with a cumulative adult equivalent exploitation rate limited to less than 5% in ocean fisheries under Council jurisdiction during the FRAM base periods, and (3) stocks listed under the ESA.
Conservation Alert and Overfishing Concern Actions for Natural Stocks that are Exceptions (those with exploitation rates limited to less than 5% in base period Council-area ocean fisheries) - Use the expertise of STT and HC to confirm negligible impacts of proposed Council fisheries, identify factors which have led to the decline or low abundance (e.g., fishery impacts outside Council jurisdiction, or degradation or loss of essential fish habitat) and monitor abundance trends and total harvest impact levels. Council action will focus on advocating measures to improve stock productivity, such as reduced interceptions in non-Council managed fisheries, and improvements in spawning and rearing habitat, fish passage, flows, and other factors affecting overall stock survival.

f/ Based on the sum of south/local and north migrating spawners per mile weighted by the total number of miles surveyed for each of the two components (2.2 miles for south/local and 7.5 miles for northern stocks).

g/ Preseason forecasts are not available for Washington coastal chinook stocks.

CHAPTER II
CHINOOK SALMON ASSESSMENT

SACRAMENTO RIVER FALL CHINOOK SALMON

Predictor Description

The Council's Salmon FMP sets the escapement goal for Sacramento River fall chinook as a range from 122,000 to 180,000 adults. This fall stock comprises approximately 90% of the escapement of all chinook stocks that return to Central Valley streams and hatcheries. The Central Valley index (CVI), which provides an annual index of abundance for the combined Central Valley chinook stocks, is the sum of ocean fishery chinook harvests in the area south of Point Arena plus the Central Valley adult chinook spawning escapement (Table II-1). The CVI harvest index is the ocean harvest landed south of Point Arena, divided by the CVI.

Prior to 1989 the STT based its projection of the CVI on recent CVI levels (with general consideration given for brood year natural escapements), hatchery releases, and the previous year jack returns. Between 1989 and 1991, several predictors of the CVI were evaluated, including weight and number of juveniles in hatchery releases and previous year jack returns. Since 1991, the STT has used a linear regression of the CVI on the previous year's Central Valley age-2 return to forecast the CVI (Figure II-1).

The CVI harvest index has varied significantly since it was first calculated in 1970. After reaching one of its lowest levels of 50% in 1985, the index rose to 78% in 1988 and ranged between 70% and 79% over the 1989-1995 period (Table II-1). The CVI harvest index fell to approximately 60% in 1996 and 1997 and to approximately 52%, 46%, and 55% in 1998, 1999, and 2000, respectively. This decline in the CVI harvest index accompanied the observed reduction in fishing effort south of Point Arena between 1996 and 2000. The 2001 index of 26% is the lowest on record and reflects a very low ocean harvest coupled with a high river return. The 2004 index of approximately 62% reflects the lowest return to the Central Valley since 1998 and the highest level of ocean harvest south of Point Arena since the 2000 fishery.

Predictor Performance

For the 1985-2003 period, the CVI preseason forecast has ranged from 0.49 to 1.63 times its postseason value (Table II-2). The 2004 CVI preseason forecast of 831,800 fish is 0.95 times its postseason estimate of 871,000 fish (Table II-2). The preseason forecast of 41% for the 2004 CVI harvest index is 0.60 times its postseason estimate of 62% (Table II-1).

2005 Stock Status

A total of 83,800 age-2 chinook are estimated to have returned to the Central Valley in 2004, forecasting a 2005 CVI of 1,678,300 adult chinook (Figure II-1), which is 2.02 times the 2004 preseason forecast, and the highest on record (since 1985).

Evaluation of 2004 Regulations on 2005 Stock Abundance

A repeat of 2004 regulations is expected to result in a CVI harvest index similar to the average of the last five years (42%). Applying the complement of this fraction (1.0-0.42) to the 2005 CVI forecast of 1,678,300 fish and multiplying that quantity by the typical percentage of Central Valley adult chinook spawners that are Sacramento River fall run fish (five-year average 87%), yields a 2005 adult escapement forecast of 846,900 Sacramento River fall chinook, which is well above the upper end of the escapement goal range (Figure II-2).

TABLE II-1. Indices of annual **abundance and ocean** fishery **impacts** on **California Central Valley chinook** in thousands of fish. (Page 1 of 1)

	Ocean Chinook Landings South of Pt. Arena			Hatchery and Natural Escapements of Central Valley Adults				
Year	Troll	Sport	Total	Fall	Other[a/]	Total	CVI Abundance (Ocean Landings + Escapement)	CVI Harvest Index (%)[b/]
1970	226.8	111.1	337.9	186.3	55.6[c/]	241.9	579.8	58
1971	150.7	166.3	317.0	196.2	62.0	258.2	575.2	55
1972	229.8	187.6	417.4	104.6	46.1	150.7	568.1	73
1973	422.5	180.9	603.4	225.4	27.1	252.5	855.9	71
1974	282.7	141.6	424.3	207.3	35.7	243.0	667.3	64
1975	234.4	92.7	327.1	162.3	47.6	209.9	537.0	61
1976	237.9	68.6	306.5	172.0	43.8	215.8	522.3	59
1977	263.8	76.6	340.4	165.6	42.8	208.4	548.8	62
1978	291.0	65.9	356.9	129.8	17.1	146.9	503.8	71
1979	234.1	108.5	342.6	171.9	11.3	183.2	525.8	65
1980	294.3	77.1	371.4	148.4	31.6	180.0	551.4	67
1981	289.9	73.8	363.7	196.9	21.8	218.7	582.4	62
1982	418.4	122.5	540.9	182.4	38.9	221.3	762.2	71
1983	178.2	53.0	231.2	129.9	14.4	144.2	375.5	62
1984	221.7	78.7	300.4	205.8	16.9	222.7	523.1	57
1985	212.3	121.8	334.1	312.7	20.7	333.4	667.5	50
1986	502.5	114.8	617.3	262.9	41.3	304.1	921.4	67
1987	446.8	152.8	599.6	202.8	21.6	224.4	824.0	73
1988	830.5	130.4	960.9	244.9	26.6	271.5	1,232.4	78
1989	363.8	130.9	494.7	155.0	18.0	173.0	667.7	74
1990	336.2	112.7	448.9	105.7	14.0	119.7	568.6	79
1991	254.6	62.1	316.7	118.3	16.4	134.6	451.3	70
1992	163.5	66.7	230.2	82.6	4.2	86.8	317.0	73
1993	259.7	99.3	359.0	139.7	5.3	144.9	503.9	71
1994	290.4	159.9	450.3	169.5	6.6	176.0	626.3	72
1995	670.6	354.6	1,025.2	302.2	16.5	318.6	1,343.8	76
1996	348.9	129.3	478.2	307.6	12.9	320.5	798.7	60
1997	482.2	208.4	690.6	368.0	46.6	414.6	1,105.2	62
1998	221.8	114.5	336.3	254.0	55.8	309.8	646.1	52
1999	285.6	76.4	362.0	408.9	21.4	430.3	792.3	46
2000	446.3	146.5	592.8	457.8	34.6	492.4	1,085.2	55
2001	172.5	59.9	232.4	574.4	73.8	648.1	880.5	26
2002	312.9	134.7	447.6	804.4	40.4	844.8	1,292.4	35
2003	239.2	69.7	308.7	541.2	45.8	587.1	895.8	34
2004[d/]	362.4	174.3	536.7	294.2	40.1[e/]	334.3	871.0	62

a/ Spring run of the current calendar year and late fall and winter runs of the following calendar year.
b/ Ocean harvest landed south of Pt. Arena as a percent of the CVI.
c/ Percent of adults in 1970 spring run assumed the same as 1971 (72%, 5,500 total).
d/ Preliminary.
e/ Late-fall and winter run contributions not yet available; most recent five-year average escapements used for these components.

TABLE II-2. Comparisons of **preseason forecast and postseason** estimates for the **CVI** in thousands of fish. (Page 1 of 1)

Year	Preseason Forecast	Postseason Estimate	Pre/Postseason
1985	524.8	667.5	0.79
1986	546.5	921.4	0.59
1987	592.9	824.1	0.72
1988	707.1	1,232.4	0.57
1989	625-885	667.7	0.94-1.33
1990	500-900	568.6	0.88-1.58
1991	466.0	451.3	1.03
1992	452.0	317.0	1.43
1993	501.0	503.9	0.99
1994	503.0	626.3	0.80
1995	654.0	1,343.8	0.49
1996	533.0	798.7	0.67
1997	849.0	1,105.2	0.77
1998	1,051.0	646.1	1.63
1999	847.7	792.3	1.07
2000	790.4	1,085.2	0.73
2001	649.4	880.5	0.74
2002	825.4	1,292.4	0.64
2003	1,108.1	895.8	1.24
2004	831.8	871.0	0.95
2005	1,678.3	-	-

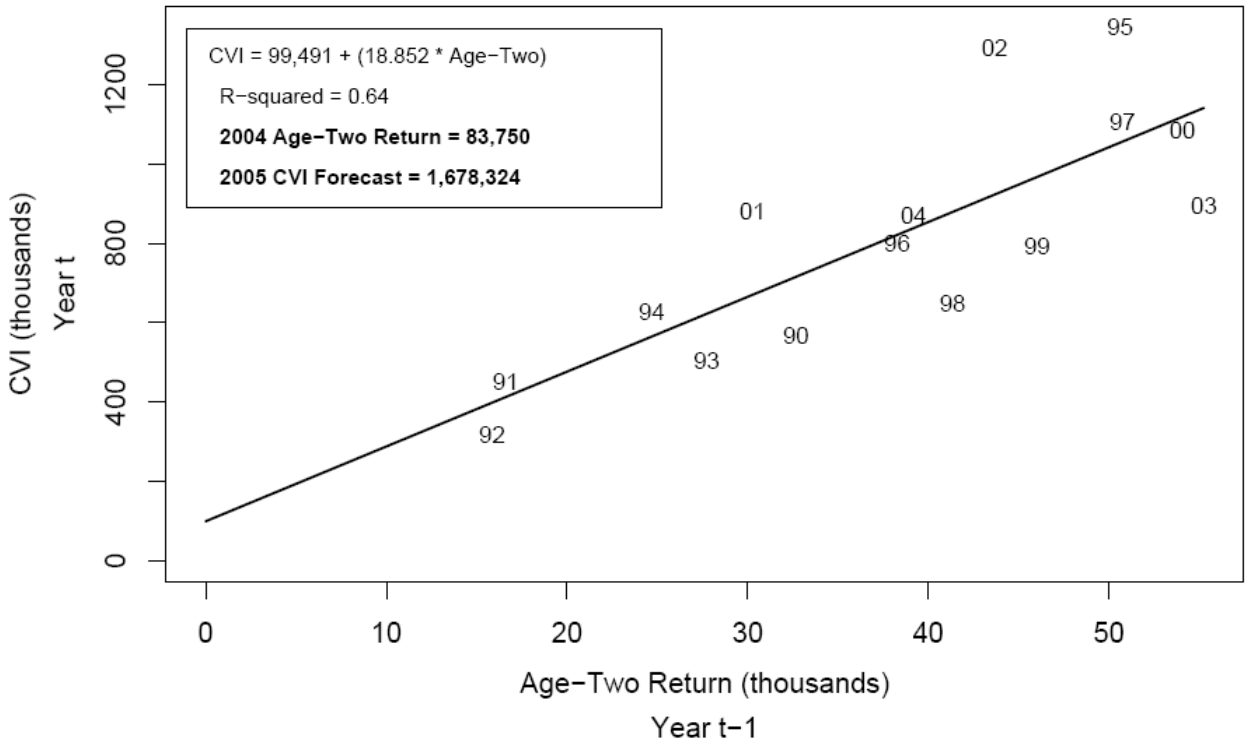

FIGURE II-1. Regression estimator for CVI based on previous year's river return of age-two Central Valley chinook, 1990-2004. Years shown are CVI year. Numbers in plot denote calendar year t.

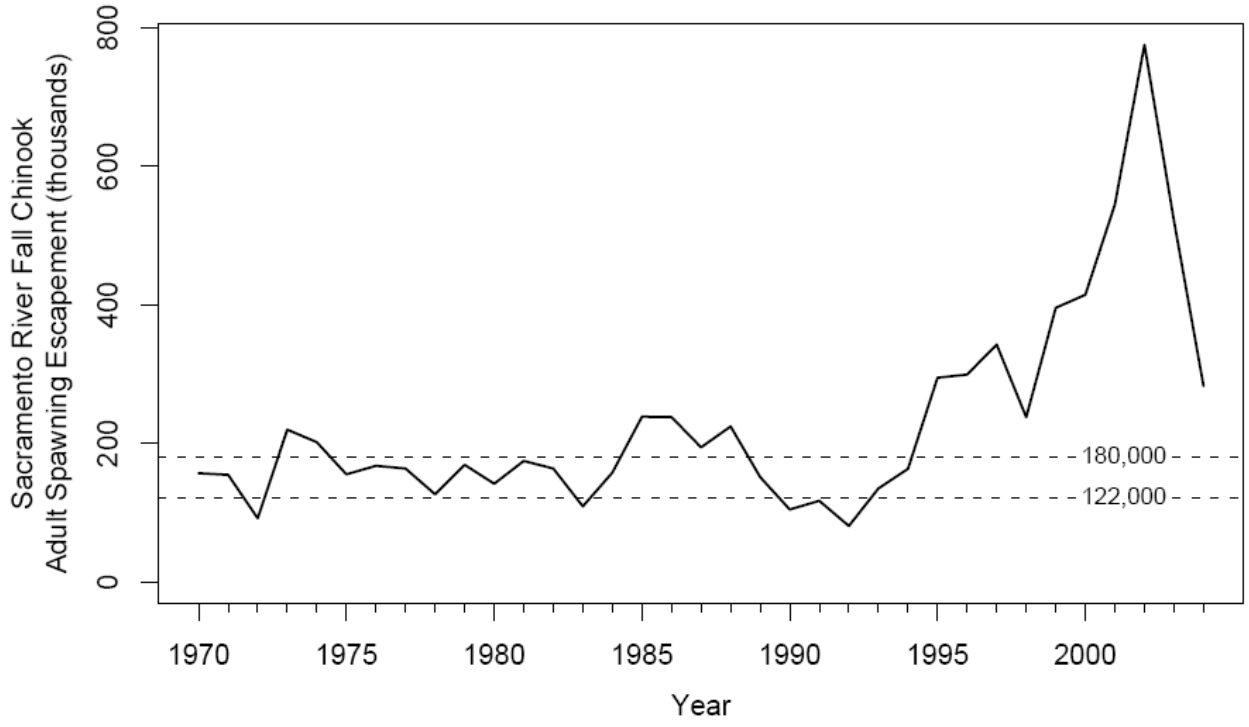

FIGURE II-2. Spawning escapements of adult Sacramento River fall chinook, 1970-2004, and the goal range for the stock of 122,000 to 180,000 adult fish.

KLAMATH RIVER FALL CHINOOK

Predictor Description

For Klamath River fall chinook, linear regressions are used to relate September 1 (preseason) ocean abundance estimates of age-3, age-4, and age-5 fish to that year's river run size estimates of age-2, age-3, and age-4 fish, respectively (Table II-3). Historical abundance estimates were derived from a cohort analysis of CWT information (brood years 1979-2000). The y-intercept of the regressions is constrained to zero, which gives the biologically reasonable expectation that a river run size of zero predicts an ocean abundance remainder of zero for the same cohort. The abundance of age-2 fish is not forecast because no precursor to age-2 fish of that brood is available. Ocean fisheries harvest small numbers of age-2 Klamath River fall chinook.

Predictor Performance

Since 1985, the preseason ocean abundance forecasts for age-3 fish have ranged from 0.31 to 2.7 times the postseason estimates; for age-4 fish from 0.47 to 2.61 times the postseason estimates; and for the adult stock as a whole from 0.34 to 2.03 times the postseason estimates (Table II-4). The September 1, 2003 age-3 forecast (72,100) was 0.40 times its postseason estimate (178,745); the age-4 forecast (134,500) was 0.79 times its postseason estimate (169,383); and the total adults forecast (216,300) was 0.57 times its postseason estimate (378,294) (Table II-4).

Management of Klamath River fall chinook harvest since 1986 has attempted to achieve specific harvest rates on fully-vulnerable age-4 and age-5 fish in ocean and river fisheries (Table II-5). The Council has used a combination of quotas and time/area restrictions in ocean fisheries in an attempt to meet the harvest rate objective set each year. Since 1992, fisheries have been managed to achieve 50/50 allocation between tribal and non-tribal fisheries. River fisheries have been managed on the basis of adult chinook quotas (tribal net fishing) and partial quotas that trigger area closures (recreational fishing).

The Council's FMP for Klamath River fall chinook (Amendment 9) permits a natural spawner reduction rate via fisheries of no more than 0.67, with a minimum escapement of 35,000 natural spawning adults. The plan allows for any ocean and river harvest allocation that meets the spawner reduction rate constraint provided it also meets the minimum escapement goal. The regulations adopted in 2004 were expected to result in 35,000 natural spawning adults and an age-4 ocean harvest rate of 15.0%. Based on postseason estimates, there were 24,200 natural spawning adults, and an age-4 ocean harvest rate of 52.0% (Table II-6).

2005 Stock Status

The forecast September 1, 2004 (preseason) ocean abundance of Klamath River fall chinook salmon is 185,700 age-3 fish, 48,900 age-4 fish, and 5,200 age-5 fish (Figure II-3). Last year's preseason forecast was 72,100 age-3, 134,500 age-4, and 9,700 age-5.

Late-season ocean fisheries in 2004 (September-November) were estimated to have harvested 30 age-3, 1,582 age-4, and 362 age-5 Klamath River fall chinook. This harvest will be deducted from the ocean fishery's allocation in determining the 2005 allowable ocean harvest.

TABLE II-3. **Klamath River fall chinook** ocean abundance (thousands), harvest rate, and river run size estimates (thousands) **by age**. (Page 1 of 1)

	Ocean Abundance Sept. 1 (t-1)			Annual Ocean Harvest Rate Sept. 1 (t-1) - Aug. 31 (t)		Klamath Basin River Run (t)				
Year (t)	Age-3	Age-4	Total	Age-3	Age-4	Age-2	Age-3	Age-4	Age-5	Total Adults
1981	493.2	57.0	550.2	0.21	0.53	28.2	64.1	14.4	1.8	80.3
1982	559.1	133.4	692.5	0.30	0.52	39.4	30.1	33.9	2.6	66.6
1983	317.9	114.4	432.3	0.19	0.60	3.8	35.9	20.7	0.9	57.5
1984	157.5	84.1	241.6	0.08	0.38	8.3	21.7	24.4	1.1	47.2
1985	374.6	56.9	431.5	0.11	0.25	69.4	32.9	25.7	5.8	64.4
1986	1307.9	141.1	1448.9	0.18	0.46	44.6	162.9	29.8	2.3	195.0
1987	786.2	343.2	1129.4	0.16	0.43	19.1	89.7	112.6	6.8	209.1
1988	750.4	236.2	986.6	0.20	0.39	24.1	101.2	86.5	3.9	191.6
1989	367.2	176.3	543.5	0.15	0.36	9.1	50.4	69.6	4.3	124.3
1990	177.7	103.1	280.8	0.30	0.55	4.4	11.6	22.9	1.3	35.9
1991	69.7	37.3	107.0	0.03	0.18	1.8	10.0	21.6	1.1	32.7
1992	39.5	28.3	67.7	0.02	0.07	13.7	6.9	18.8	1.0	26.7
1993	164.8	15.0	179.8	0.05	0.16	7.6	48.3	8.2	0.7	57.2
1994	116.2	39.6	155.8	0.03	0.09	14.4	36.0	24.7	1.0	61.7
1995	768.3	27.6	796.0	0.04	0.13	22.8	193.8	17.5	2.4	213.8
1996	190.5	225.6	416.1	0.05	0.16	9.5	38.8	136.7	0.3	175.8
1997	140.4	62.9	203.3	0.01	0.06	8.0	35.0	44.2	4.6	83.7
1998	154.6	44.9	199.4	0.00	0.09	4.6	59.2	29.7	1.7	90.6
1999	129.2	30.2	159.5	0.01	0.09	19.2	29.2	20.5	1.3	51.0
2000	617.0	44.2	661.3	0.06	0.10	10.2	187.1	30.5	0.5	218.1
2001	357.4	134.0	491.4	0.03	0.09	11.3	99.1	88.2	0.2	187.4
2002	571.4	99.8	671.1	0.03	0.15	9.2	94.6	62.5	3.7	160.8
2003	548.2[a/]	223.3	771.6	0.10[a/]	0.23	3.8	94.3	96.8	0.9	191.9
2004	178.7[b/]	169.4[a/]	348.1	----[c/]	0.52[a/]	9.7	33.2	40.6	5.3	79.1

a/ Preliminary: incomplete cohort data (age-5 unavailable).
b/ Preliminary: incomplete cohort data (age-4 and age-5 unavailable).
c/ Not Estimated: incomplete cohort data (age-4 and age-5 unavailable).

TABLE II-4. Comparisons of **preseason forecast and postseason** estimates for ocean abundance of adult **Klamath River fall chinook**. (Page 1 of 2)

Year (t)	Preseason Forecast[a/] Sept. 1 (t-1)	Postseason Estimate Sept. 1 (t-1)	Pre/Postseason
	Age-3		
1985	113,000	276,000	0.41
1986	426,000[b/]	1,307,875	0.33
1987	511,800	786,245	0.65
1988	370,800	750,440	0.49
1989	450,600	367,173	1.23
1990	479,000	177,718	2.70
1991	176,200	69,654	2.53
1992	50,000	39,466	1.27
1993	294,400	164,847	1.79
1994	138,000	116,194	1.19
1995	269,000	768,346	0.35
1996	479,800	190,497	2.52
1997	224,600	140,383	1.60
1998	176,000	154,589	1.14
1999	84,800	129,235	0.66
2000	349,600	617,048	0.57
2001	187,200	357,364	0.52
2002	209,000	571,350	0.37
2003	171,300	548,221	0.31
2004	72,100	178,745[c/]	0.40[c/]
2005	185,700	-	-
	Age-4		
1985	56,875	57,500	0.99
1986	66,250	141,062	0.47
1987	206,125	343,163	0.60
1988	186,375	236,204	0.79
1989	215,500	176,327	1.22
1990	50,125	103,110	0.49
1991	44,625	37,323	1.20
1992	44,750	28,264	1.58
1993	39,125	15,002	2.61
1994	86,125	39,624	2.17
1995	47,000	27,608	1.70
1996	268,500	225,581	1.19
1997	53,875	62,897	0.86
1998	46,000	44,856	1.03
1999	78,750	30,244	2.60
2000	38,875	44,239	0.88
2001	247,000	134,015	1.84
2002	143,800	99,574	1.44
2003	132,400	223,329	0.59
2004	134,500	169,383[c/]	0.79[c/]
2005	48,900	-	-

TABLE II-4. Comparisons of **preseason forecast and postseason** estimates for ocean abundance of adult **Klamath River fall chinook**. (Page 2 of 2)

Year (t)	Preseason Forecast[a/] Sept. 1 (t-1)	Postseason Estimate Sept. 1 (t-1)	Pre/Postseason
		Age-5	
1985	NA	11,272	NA
1986	NA	5,877	NA
1987	5,250	19,521	0.27
1988	13,250	14,707	0.90
1989	10,125	9,595	1.06
1990	7,625	7,710	0.99
1991	1,500	2,780	0.54
1992	1,250	1,448	0.86
1993	1,125	1,770	0.64
1994	500	1,423	0.35
1995	2,000	3,577	0.56
1996	1,125	788	1.43
1997	7,875	8,875	0.89
1998	3,250	2,390	1.36
1999	2,000	2,103	0.95
2000	1,375	859	1.60
2001	1,250	259	4.83
2002	9,700	6,933	1.40
2003	6,500	2,062	3.15
2004	9,700	30,166[c/]	0.32[c/]
2005	5,200	-	-
		Total Adults	
1985	169,875	344,772	0.49
1986	492,250	1,454,814	0.34
1987	723,175	1,148,929	0.63
1988	570,425	1,001,351	0.57
1989	676,225	553,095	1.22
1990	536,750	288,538	1.86
1991	222,325	109,757	2.03
1992	96,000	69,178	1.39
1993	334,650	181,619	1.84
1994	224,625	157,241	1.43
1995	318,000	799,531	0.40
1996	749,425	416,866	1.80
1997	286,350	212,155	1.35
1998	225,250	201,835	1.12
1999	165,550	161,582	1.02
2000	389,850	662,146	0.59
2001	435,450	491,638	0.89
2002	362,500	678,037	0.53
2003	310,200	773,612	0.40
2004	216,300	378,294[c/]	0.57[c/]
2005	239,700	-	-

a/ Original preseason forecasts for years 1985-2001 were for May 1 (t); converted to Sept. 1 (t-1) forecasts by dividing the assumed May 1 (t) number by the Sept. 1 (t-1) through May 1 (t) survival rate in those years: 0.5 age-3, 0.8 age-4, 0.8 age-5.

b/ A scalar of 0.75 was applied to the jack count because, (1) most jacks returned to the Trinity River, and (2) the jack count was outside the database range.

c/ Preliminary.

TABLE II-5. Summary of **management objectives** and predictor performance for **Klamath River fall chinook**. (Page 1 of 1)

	Preseason Ocean Abundance Forecast[a/] Sept. 1 (t-1)		Postseason Ocean Abundance Estimate Sept. 1 (t-1)		Preseason Age-4 Harvest Rate Forecast[b/]		Postseason Age-4 Harvest Rate Estimate[c/]		Preseason Adult Harvest Forecast		Postseason Adult Harvest Estimate	
Year(t)	Age-3	Age-4	Age-3	Age-4	Ocean	River	Ocean	River	Ocean	River	Ocean	River
1986	426,000	66,250	1,307,875	141,062	0.28	0.50	0.46	0.67	72,000	37,700	304,888	46,154
1987	511,800	206,125	786,245	343,163	0.28	0.53	0.43	0.44	121,200	78,200	279,309	73,265
1988	370,800	186,375	750,440	236,204	0.31	0.53	0.39	0.52	114,100	65,400	252,559	73,854
1989	450,600	215,500	367,173	176,327	0.30	0.49	0.36	0.70	128,100	67,600	123,829	54,340
1990	479,000	50,125	177,718	103,110	0.30	0.49	0.55	0.36	85,100	31,200	114,950	11,459
1991	176,200	44,625	69,654	37,323	0.13	0.28	0.18	0.45	16,700	12,800	9,962	13,581
1992	50,000	44,750	39,466	28,264	0.06	0.15	0.07	0.27	4,200	4,200	3,160	6,787
1993	294,400	39,125	164,847	15,002	0.12	0.43	0.16	0.49	20,100	22,500	11,266	12,808
1994	138,000	86,125	116,194	39,624	0.07	0.20	0.09	0.30	10,400	14,300	8,527	13,524
1995	269,000	47,000	768,346	27,608	0.07	0.32	0.13	0.20	13,500	18,500	31,303	21,638
1996	479,800	268,500	190,497	225,581	0.17	0.66	0.16	0.39	88,400	129,100	44,928	69,241
1997	224,600	53,875	140,383	62,897	0.10	0.43	0.06	0.26	17,600	26,500	8,623	17,764
1998	176,000	46,000	154,589	44,856	0.07	0.29	0.09	0.30	10,200	14,800	4,916	17,897
1999	84,800	78,750	129,235	30,244	0.10	0.28	0.09	0.45	12,300	18,100	5,083	16,942
2000	349,600	38,875	617,048	44,239	0.11	0.53	0.10	0.25	24,000	32,400	41,908	35,066
2001	187,200	247,000	357,364	134,015	0.14	0.61	0.09	0.29	45,600	105,300	21,638	50,780
2002	209,000	143,800	571,350	99,754	0.13	0.57	0.15	0.26	30,000	70,900	31,850	35,069
2003	171,300	132,400	548,221	223,329	0.16	0.50	0.23	0.28	30,600	52,200	104,880	39,715
2004[d/]	72,100	134,500	178,745	169,383	0.15	0.38	0.52	0.47	26,454	35,791	127,639	29,534
2005	185,700	48,900	-	-	-	-	-	-	-	-	-	-

a/ Original preseason forecasts for years 1986-2001 were for May 1 (t); converted to Sept. 1 (t-1) forecasts by dividing the May 1 (t) number by the assumed Sept. 1 (t-1) through May 1 (t) survival rate assumed in those years: 0.5 age-3, 0.8 age-4, 0.8 age-5.

b/ Ocean harvest rate forecast is the fraction of the predicted ocean abundance expected to be harvested Sept. 1 (t-1) through August 31(t). River harvest rate forecast is the fraction of the predicted river run expected to be harvested in river fisheries. Original ocean harvest rate forecasts for year (t), 1986-2001, were based on a May 1 (t) ocean abundance denominator; converted to Sept. 1 (t-1) abundance denominator by multiplying former values by 0.8 (the assumed age-4 survival rate between Sept. 1 (t-1) and May 1 (t) in those years).

c/ Ocean harvest rate is the fraction of the postseason ocean abundance harvested Sept. 1 (t-1) through August 31 (t). River harvest rate is the fraction of the river run harvested by river fisheries.

d/ Postseason estimates are preliminary.

TABLE II-6. **Harvest** levels and rates of age-3 and age-4 **Klamath River fall chinook**. (Page 1 of 2)

	Ocean Fisheries (Sept. 1 (t-1) - Aug. 31 (t))							River Fisheries (t)		
	KMZ			North of	South of		Ocean			
Year (t)	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
					HARVEST (numbers of fish)					
Age-3										
1986	35,753	4,884	40,637	74,118	123,212	197,330	237,967	8,100	18,100	26,200
1987	17,555	5,158	22,713	43,459	57,348	100,807	123,520	11,400	11,400	22,800
1988	15,687	5,065	20,752	23,730	106,606	130,336	151,088	12,500	15,600	28,100
1989	6,308	11,770	18,078	15,272	23,450	38,722	56,800	2,700	900	3,600
1990	81	4,441	4,522	37,056	11,159	48,215	52,737	1,300	1,400	2,700
1991	0	1,032	1,032	350	824	1,174	2,206	2,123	1,277	3,400
1992	0	0	0	971	0	971	971	970	251	1,221
1993	0	812	812	819	6,360	7,179	7,991	5,426	2,917	8,343
1994	41	572	613	0	3,266	3,266	3,879	4,543	971	5,514
1995	0	985	985	11,857	14,478	26,335	27,320	11,840	5,536	17,376
1996	0	0	0	0	9,141	9,141	9,141	12,363	3,661	16,024
1997	0	233	233	611	1,211	1,822	2,055	2,166	2,736	4,902
1998	0	6	6	296	466	762	768	2,231	5,781	8,012
1999	61	174	235	1,252	435	1,687	1,922	4,981	1,748	6,729
2000	404	3,245	3,649	8,735	24,894	33,629	37,278	22,458	4,893	27,351
2001	115	105	220	2,738	6,016	8,754	8,974	17,885	7,294	25,179
2002	266	945	1,211	1,953	11,897	13,850	15,061	11,734	6,258	17,992
2003	297	1,322	1,619	3,439	47,135	50,574	52,193	6,996	5,061	12,057
2004[a/]	430	1,001	1,431	10,186	7,621	17,807	19,238	4,616	2,023	6,639
Age-4										
1986	7,762	1,117	8,879	23,407	31,993	55,400	64,279	17,000	2,900	19,900
1987	21,753	4,432	26,185	71,218	48,907	120,125	146,310	41,000	8,500	49,500
1988	11,920	3,628	15,548	27,088	50,492	77,580	93,128	38,600	6,200	44,800
1989	5,924	9,608	15,532	31,915	16,268	48,183	63,715	41,000	7,700	48,700
1990	3,955	2,864	6,819	39,375	10,498	49,873	56,692	6,000	2,200	8,200
1991	0	1,006	1,006	1,529	4,172	5,701	6,707	7,593	2,016	9,609
1992	172	55	227	1,799	12	1,811	2,038	4,360	723	5,083
1993	0	0	0	850	1,605	2,455	2,455	3,786	243	4,029
1994	0	1,073	1,073	1,117	1,419	2,536	3,609	6,666	812	7,478
1995	0	224	224	1,757	1,702	3,459	3,683	2,957	481	3,438
1996	769	3,451	4,220	10,277	20,765	31,042	35,262	43,959	9,080	53,039
1997	3	170	173	460	2,974	3,434	3,607	8,734	2,586	11,320
1998	0	101	101	3,973	0	3,973	4,074	7,164	1,822	8,986
1999	15	378	393	1,655	693	2,348	2,741	8,789	494	9,283
2000	116	892	1,008	2,453	1,052	3,505	4,513	6,733	756	7,489
2001	1,303	1,593	2,896	5,813	3,916	9,729	12,625	20,759	4,819	25,578
2002	1,932	822	2,754	3,266	9,320	12,586	15,340	11,929	4,063	15,992
2003	1,078	1,188	2,266	10,623	38,520	49,143	51,409	22,754	4,592	27,346
2004[a/]	3,505	2,969	6,474	28,731	53,589	82,320	88,794	17,487	1,738	19,225

TABLE II-6. **Harvest** levels and rates of age-3 and age-4 **Klamath River fall chinook**. (Page 2 of 2)

	Ocean Fisheries (Sept. 1 (t-1) - Aug. 31 (t))							River Fisheries (t)		
	KMZ			North of	South of		Ocean			
Year (t)	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
					HARVEST RATE					
Age-3										
1986	0.03	0.00	0.03	0.06	0.09	0.15	0.18	0.05	0.11	0.16
1987	0.02	0.01	0.03	0.06	0.07	0.13	0.16	0.13	0.13	0.25
1988	0.02	0.01	0.03	0.03	0.14	0.17	0.20	0.12	0.15	0.28
1989	0.02	0.03	0.05	0.04	0.06	0.11	0.15	0.05	0.02	0.07
1990	0.00	0.02	0.03	0.21	0.06	0.27	0.30	0.11	0.12	0.23
1991	0.00	0.01	0.01	0.01	0.01	0.02	0.03	0.21	0.13	0.34
1992	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.14	0.04	0.18
1993	0.00	0.00	0.00	0.00	0.04	0.04	0.05	0.11	0.06	0.17
1994	0.00	0.00	0.01	0.00	0.03	0.03	0.03	0.13	0.03	0.15
1995	0.00	0.00	0.00	0.02	0.02	0.03	0.04	0.06	0.03	0.09
1996	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.32	0.09	0.41
1997	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.08	0.14
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10	0.14
1999	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.17	0.06	0.23
2000	0.00	0.01	0.01	0.01	0.04	0.05	0.06	0.12	0.03	0.15
2001	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.18	0.07	0.25
2002	0.00	0.00	0.00	0.00	0.02	0.02	0.03	0.12	0.07	0.19
2003	0.00	0.00	0.00	0.01	0.09	0.09	0.10	0.07	0.05	0.13
2004[a/]	0.00	0.01	0.01	0.06	0.04	0.10	0.11	0.14	0.06	0.20
Age-4										
1986	0.06	0.01	0.06	0.17	0.23	0.39	0.46	0.57	0.10	0.67
1987	0.06	0.01	0.08	0.21	0.14	0.35	0.43	0.36	0.08	0.44
1988	0.05	0.02	0.07	0.11	0.21	0.33	0.39	0.45	0.07	0.52
1989	0.03	0.05	0.09	0.18	0.09	0.27	0.36	0.59	0.11	0.70
1990	0.04	0.03	0.07	0.38	0.10	0.48	0.55	0.26	0.10	0.36
1991	0.00	0.03	0.03	0.04	0.11	0.15	0.18	0.35	0.09	0.45
1992	0.01	0.00	0.01	0.06	0.00	0.06	0.07	0.23	0.04	0.27
1993	0.00	0.00	0.00	0.06	0.11	0.16	0.16	0.46	0.03	0.49
1994	0.00	0.03	0.03	0.03	0.04	0.06	0.09	0.27	0.03	0.30
1995	0.00	0.01	0.01	0.06	0.06	0.13	0.13	0.17	0.03	0.20
1996	0.00	0.02	0.02	0.05	0.09	0.14	0.16	0.32	0.07	0.39
1997	0.00	0.00	0.00	0.01	0.05	0.05	0.06	0.20	0.06	0.26
1998	0.00	0.00	0.00	0.09	0.00	0.09	0.09	0.24	0.06	0.30
1999	0.00	0.01	0.01	0.05	0.02	0.08	0.09	0.43	0.02	0.45
2000	0.00	0.02	0.02	0.06	0.02	0.08	0.10	0.22	0.02	0.25
2001	0.01	0.01	0.02	0.04	0.03	0.07	0.09	0.24	0.05	0.29
2002	0.02	0.01	0.03	0.03	0.09	0.13	0.15	0.19	0.06	0.26
2003	0.00	0.01	0.01	0.05	0.17	0.22	0.23	0.24	0.05	0.28
2004[a/]	0.02	0.02	0.04	0.17	0.32	0.49	0.52	0.43	0.04	0.47

a/ Preliminary.

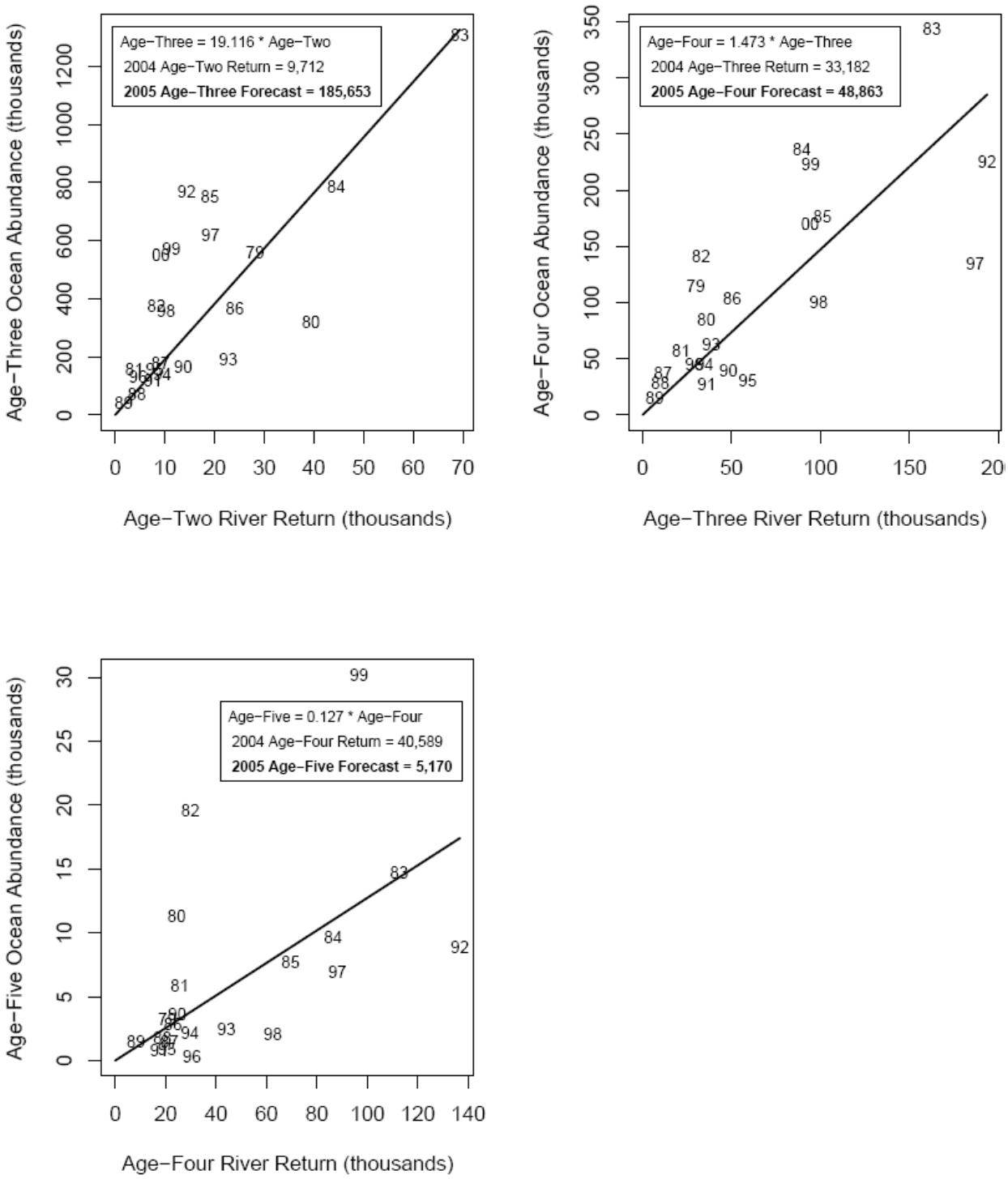

FIGURE II-3. Regression estimators for Klamath River fall chinook ocean abundance (September 1) based on that year's river return of same cohort. Numbers in plots denote brood years.

Evaluation of 2004 Regulations on 2005 Stock Abundance

A full assessment of the 2004 ocean and river fishery regulations on the 2005 stock abundance forecast has not been completed at this time. However, the current assessment indicates a repeat of these regulations would be expected to result in fewer than 35,000 natural area adult spawners, and thus, fail to meet the minimum spawner requirement.

OTHER CALIFORNIA COASTAL CHINOOK STOCKS

Other California coastal streams that support fall chinook stocks, which contribute to ocean fisheries off Oregon and California, include the Smith, Little, Mad, Eel, and Mattole rivers, and Redwood Creek. These stocks are included in the California coastal chinook ESU, which are listed as threatened under the ESA. Current information is insufficient to forecast the ocean abundance of these stocks, however, the NMFS ESA consultation standard restricts the Klamath River fall chinook age-4 ocean harvest rate to no more than 16% to limit impacts on these stocks. A full assessment of the 2004 ocean regulations on the 2005 Klamath River fall chinook stock abundance forecast has not been completed at this time. However, the current assessment indicates a repeat of these regulations would be expected to result in an ocean harvest rate greater than 16% on age-4 Klamath fall chinook, and thus, fail to meet the NMFS ESA consultation standard.

OREGON COASTAL CHINOOK STOCKS

Oregon coastal chinook stocks are categorized into two major subgroups based on ocean migration patterns. Although their ocean harvest distributions overlap somewhat, they have been labeled as either north or south/local migrating.

North Migrating Chinook

North migrating chinook stocks include stocks north of and including the Elk River, with the exception of Umpqua River spring chinook. Based on CWT analysis, the populations from ten major North Oregon Coast (NOC) river systems from the Nehalem through the Siuslaw Rivers are harvested primarily in ocean fisheries off British Columbia, Canada and Southeast Alaska, and to a much lesser degree in Council area and terminal area (state waters) fisheries off Washington and Oregon. CWT analysis indicates populations from five major mid-Oregon Coast (MOC) systems from the Coos through the Elk Rivers are harvested primarily in ocean fisheries off British Columbia, Canada, Washington, and Oregon with minor contributions to California fisheries.

Predictor Description and 2005 Stock Status

Quantitative abundance predictions are not made for these stocks for use in annual development of Council area fishery regulations. Qualitative expectations of abundance are based on parental year spawner escapements and hatchery indicator stock data used in the PSC management process.

Natural spawner escapement is assessed yearly from the Nehalem through Coquille rivers. Peak spawning counts of adults are obtained from standard index areas on these rivers and monitored to assess stock trends (*Review of 2004 Ocean Salmon Fisheries*, Chapter II, Table II-4 and Figure II-3). Natural fall chinook stocks from both the NOC and MOC dominate production from this subgroup. Also present in lesser numbers are naturally-produced spring chinook stocks from several rivers, and hatchery fall and/or spring chinook released in the Trask, Nestucca, Salmon, Alsea, and Elk Rivers.

North Oregon Coast

Since 1986, the Salmon River Hatchery production has been CWT'd primarily used as an indicator stock for the NOC stock component. Because these fish are harvested in fisheries north of the Council management area, the STT has not reviewed the procedure by which this indicator stock is used in estimating annual stock status. Based on this indicator stock and compared with index abundances since 1986, expectations in 2005 are the NOC stock will be above average abundance levels.

Mid-Oregon Coast

Since 1992, the Elk River Hatchery production has been CWT'd for use as an indicator stock for the MOC stock component. Age specific ocean abundance forecasts for 2005 are not currently available. The STT has not undertaken a review of the methods used by Oregon Department of Fish and Wildlife (ODFW) staff in preparing these abundance forecasts.

Based on the density index of total spawners, the generalized expectation for NOC and MOC stocks in 2005 is for above average abundance. The density of adults observed since 1985 has met or exceeded the goal of 60-90 spawners per mile, a primary indicator that these stocks are generally healthy (*Review of 2004 Ocean Salmon Fisheries*, Appendix B, Table B-11).

South/Local Migrating Chinook

South/local migrating chinook stocks include Rogue River spring and fall chinook and fall chinook from smaller rivers south of the Elk River. These stocks are important contributors to ocean fisheries off Oregon and northern California. Another central Oregon stock, Umpqua River spring chinook, contributes primarily to ocean fisheries off Oregon and California and to a lesser degree, off Washington, British Columbia, Canada, and southeast Alaska.

Predictor Description and 2005 Stock Status

Quantitative abundance predictions are not made for these stocks, although an abundance index for Rogue River fall chinook has been developed. General trends in stock abundance for southern Oregon coastal chinook stocks are assessed through escapement indices (*Review of 2004 Ocean Salmon Fisheries*, Chapter II, Table II-4 and Figure II-3).

Natural fall chinook stocks from river systems south of the Elk River and spring chinook stocks from the Rogue and Umpqua Rivers dominate production from this subgroup. Also present in lesser numbers are hatchery fall chinook, primarily from the Chetco River. Substantial releases of hatchery spring chinook occur in both the Rogue and Umpqua Rivers.

Umpqua River and Rogue River Spring Chinook

Umpqua and Rogue rivers spring chinook contribute to ocean fisheries primarily as age-3 fish. Mature chinook enter the rivers primarily during April and May and generally prior to annual ocean fisheries. Quantitative abundance predictions are not made for these stocks.

Rogue River Fall Chinook

Rogue River fall chinook contribute to ocean fisheries principally as age-3 through age-5 fish. Mature fish enter the river each year from mid-July through October, with the peak of the run occurring during August and September.

Annual predictions of Rogue River fall chinook are used for ocean impact modeling. The Rogue River fall chinook ocean abundance index is based on carcass counts, ocean exploitation rates, and cohort reconstruction methods. Linear regression analysis is used to relate the Rogue River fall chinook ocean abundance index for age-3, age-4, and age-5 fish to carcass counts of age-2, age-3 and age-4 fish, respectively, of the previous year. The inriver age composition estimates are based on scale sampling of carcasses. Since 1979, ocean exploitation rates have been based on Klamath River fall chinook CWT analysis because Rogue River fall chinook ocean exploitation rate information is not available. The ocean harvest distribution and age composition of Rogue and Klamath fall chinook are assumed to be similar. The 2005 Rogue River fall chinook ocean abundance prediction is 10,200 (Table II-7).

Other Stocks

Information is insufficient to forecast the abundance of fall chinook from other smaller rivers south of the Elk River. These stocks are minor contributors to general season mixed stock ocean fisheries.

Evaluation of 2004 Regulations on 2005 Stock Abundance

Given the 2004 regulations and the projected 2005 Oregon coastal chinook stock abundance, it is expected the aggregate Oregon coastal chinook goal of 150,000 to 200,000 naturally spawning adults will be met.

TABLE II-7. **Rogue River fall chinook** inriver run and ocean **population indices**. (Page 1 of 1)

Return Year	Inriver Run Index in Thousands of Fish[a/]					Ocean Impact Rate by Age[b/]		Ocean Population Index in Thousands of Fish[c/]			
	Age-2	Age-3	Age-4	Age-5	Total[d/]	Age-3	Age-4-5	Age-3	Age-4	Age-5	Total
1977	2.4	1.0	0.3	0.0	3.7	0.23	0.55	9.7	1.4	0.1	11.2
1978	1.0	6.1	2.3	0.1	9.5	0.23	0.55	37.7	5.2	0.2	43.1
1979	0.2	1.0	6.5	0.0	7.7	0.23	0.55	7.5	18.2	0.1	25.8
1980	0.4	0.2	0.9	0.6	2.1	0.23	0.55	4.9	3.8	1.4	10.1
1981	1.1	3.3	1.0	0.3	5.7	0.21	0.53	8.8	2.8	0.6	12.2
1982	0.7	1.3	1.3	0.1	3.4	0.30	0.52	9.8	2.9	0.3	13.0
1983	0.3	1.1	1.5	0.0	2.9	0.19	0.60	8.6	4.4	0.1	13.1
1984	0.4	1.2	1.8	0.1	3.5	0.08	0.38	9.8	4.7	0.2	14.7
1985	2.5	1.3	3.5	0.6	7.9	0.11	0.25	9.5	6.2	0.9	16.6
1986	3.1	12.5	2.3	0.5	18.4	0.18	0.46	72.0	5.8	0.9	78.7
1987	2.6	7.8	18.1	0.4	28.9	0.16	0.43	80.5	37.2	0.6	118.3
1988	1.4	4.8	25.2	1.5	32.9	0.20	0.39	17.2	47.9	2.5	67.6
1989	0.5	1.3	4.0	2.0	7.8	0.15	0.36	8.4	7.1	3.2	18.7
1990	0.0	0.3	1.4	0.2	1.9	0.30	0.55	6.0	4.7	0.5	11.2
1991	0.2	0.4	1.9	0.5	3.0	0.03	0.18	3.5	3.2	0.6	7.3
1992	0.5	0.3	1.5	0.5	2.8	0.02	0.07	4.3	2.4	0.6	7.4
1993	0.3	3.5	1.5	0.5	5.8	0.05	0.16	16.0	3.2	0.6	19.8
1994	0.5	0.8	5.8	0.9	8.0	0.03	0.09	3.0	9.4	0.9	13.3
1995	0.2	0.6	1.4	2.0	4.2	0.04	0.13	4.1	1.7	2.3	8.3
1996	0.1	0.4	1.8	0.1	2.4	0.05	0.16	2.4	2.7	0.1	5.3
1997	0.1	0.3	1.0	0.3	1.7	0.01	0.06	5.2	1.5	0.3	7.1
1998	0.0	0.5	2.8	0.3	3.6	0.00	0.09	3.8	3.9	0.3	8.1
1999	0.2	0.3	1.6	0.5	2.6	0.01	0.09	1.5	2.7	0.6	4.7
2000	0.2	2.0	0.8	0.6	3.6	0.06	0.10	9.9	0.9	0.6	11.4
2001	0.8	2.3	4.2	0.0	7.3	0.03	0.09	13.9	5.9	0.0	19.8
2002	0.9	4.0	7.1	0.8	12.7	0.02	0.15	36.1	9.0	0.9	46.0
2003	0.9	2.3	12.0	0.4	15.6	0.08	0.21	14.1[e/]	25.1[e/]	0.5	40.0
2004	0.4	0.6	4.9	2.9	8.8	0.11	0.54	18.1[e/]	7.7[e/]	1.8	27.6
2005	-	-	-	-	-	-	-	7.2	2.1	0.9	10.2[f/]

a/ Index based on carcass counts in spawning survey index areas. Carcass counts in 1978, 1979, and 1980 adjusted for prespawning mortality. Age composition developed from carcass scale sampling.
b/ Exploitation rates since 1981 are based on Klamath River fall chinook cohort analysis, 1977-1980 based on 1981-1983 average.
c/ Based on cohort reconstruction methods. Index values for 2004 predicted from regression equations; postseason estimates are not available.
d/ Excludes age-six fish.
e/ Preliminary, complete cohort not available, mean maturity rate used to derive estimate.
f/ Preseason forecast.

CHINOOK STOCKS NORTH OF CAPE FALCON

Columbia River Fall Chinook

Predictor Description and Past Performance

Columbia River fall chinook stocks typically form the largest contributing stock group to Council chinook fisheries north of Cape Falcon. Abundance of these stocks is a major factor in determining impacts of fisheries on weak natural stocks critical to Council area management. Abundance predictions are made for five major fall stock units characterized as being hatchery or natural production, and originating above or below Bonneville Dam. The upriver brights (URB) and lower river wild (LRW) are primarily naturally-produced stocks. The lower river hatchery (LRH) tule, Spring Creek Hatchery (SCH) tule, and mid-Columbia brights (MCB) are primarily hatchery-produced stocks. The tule stocks generally mature at an earlier age than the bright fall stocks and do not migrate as far north. Minor stocks include lower river bright (LRB), a naturally-produced stock, and Select Area brights (SAB), a hatchery stock originally from Rogue River stock; both occur downstream from Bonneville Dam.

Preseason estimates of Columbia River fall chinook stock abundance, used by the STT to assess the Council's adopted fishery regulations, are based on age- and stock-specific forecasts of annual ocean escapement (return to the Columbia River). These forecasts are developed by the technical staffs of the Columbia River management agencies. Columbia River return forecast methodologies used for Council management are generally identical to those used for planning Columbia River fall season fisheries, although minor updates to Council estimates of inriver run size may occur prior to finalization of the inriver fishery plans.

The 2005 return of each fall chinook stock group is estimated using relationships between successive age groups within a cohort. The database for these relationships was constructed by combining age-specific estimates of escapement and inriver fishery catches for years since 1964 (except for MCB, which started in 1980). Typically, only the more recent broods are used in the current predictions. Fall chinook stock identification in the Columbia River mixed stock fisheries is determined by sampling catch and escapement for such factors as CWT recovery and visual stock identification (VSI). Age composition estimates are based on CWT data and scale reading of fishery and escapement samples, where available. These stock and age data for Columbia River fall chinook are the basis for the return data presented in the *Review of 2004 Ocean Salmon Fisheries* (Appendix B, Tables B-15 through B-20). The 2004 returns for the five fall chinook stocks listed in this report may differ somewhat from those provided in the *Review of 2004 Ocean Salmon Fisheries*, since ocean escapement estimates may have been updated after that report was printed.

Performance of the preliminary inriver run size estimation methodology can be assessed, in part, by examining the differences between preseason and postseason estimates (Table II-8). The recent 10-year average March preliminary preseason estimates as a percentage of the postseason estimates for the URB, LRW, LRH, SCH, and MCB stock estimates are 0.88, 0.81, 0.71, 0.79, and 0.90 respectively. The only March preliminary preseason estimate to show a consistent bias was LRH, which has been under predicted the past 11 years. The other four stocks have been both over and under predicted.

Ocean escapement estimates developed for the March Council meeting do not take into account marine harvest, which has varied during the last 20 years. The STT combines the initial inriver run size (ocean escapement) with expected Council area fishery harvest levels and stock distribution patterns to produce adjusted ocean escapement estimates based on the proposed ocean fishing regulations (Table II-8). These revised estimates are available at the end of the Council preseason planning process in April and should provide a more accurate prediction of ocean escapement.

TABLE II-8. **Predicted and postseason** returns of **Columbia River** adult **fall chinook** in thousands of fish. (Page 1 of 3)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
URB	1984	90.1	93.0	131.4	0.69	0.71
	1985	159.1	159.1	196.4	0.81	0.81
	1986	285.9	286.1	281.6	1.02	1.02
	1987	436.4	436.4	420.7	1.04	1.04
	1988	450.7	446.5	339.9	1.33	1.31
	1989	234.0	231.8	261.3	0.90	0.89
	1990	127.2	126.9	153.6	0.83	0.83
	1991	88.8	88.9	103.3	0.86	0.86
	1992	68.4	66.3	81.0	0.84	0.82
	1993	84.5	82.7	102.9	0.82	0.80
	1994	85.4	94.7	132.8	0.64	0.71
	1995	103.7	125.0	106.5	0.97	1.17
	1996	88.9	94.2	143.2	0.62	0.66
	1997	166.4	158.0	161.7	1.03	0.98
	1998	150.8	141.8	142.3	1.06	1.00
	1999	147.5	102.1	166.1	0.89	0.61
	2000	171.1	208.2	155.7	1.10	1.34
	2001	127.2	132.7	232.6	0.55	0.57
	2002	281.0	273.8	276.9	1.01	0.99
	2003	280.4	253.2	373.2	0.75	0.68
	2004	292.2	287.0	367.9	0.79	0.78
	2005	352.2	-	-	-	-
LRW	1984	16.7	NA	13.3	1.26	NA
	1985	12.9	NA	13.3	0.97	NA
	1986	15.7	NA	24.5	0.64	NA
	1987	29.2	NA	37.9	0.77	NA
	1988	43.3	42.1	41.7	1.04	1.01
	1989	27.3	26.9	38.6	0.71	0.70
	1990	23.7	23.4	20.3	1.17	1.15
	1991	12.7	12.7	19.8	0.64	0.64
	1992	17.4	16.7	12.5	1.39	1.34
	1993	12.5	11.9	13.3	0.94	0.89
	1994	14.7	13.2	12.2	1.20	1.08
	1995	12.4	11.5	16.0	0.78	0.72
	1996	8.8	8.1	14.6	0.60	0.55
	1997	7.5	7.2	12.3	0.61	0.59
	1998	8.1	7.0	7.3	1.11	0.96
	1999	2.6	2.5	3.3	0.79	0.76
	2000	3.5	2.7	10.2	0.34	0.26
	2001	16.7	18.5	15.7	1.06	1.18
	2002	18.7	18.3	24.9	0.75	0.73
	2003	24.6	23.4	26.0	0.95	0.90
	2004	24.1	24.2	22.3	1.08	1.09
	2005	20.2	-	-	-	-

TABLE II-8. **Predicted and postseason** returns of **Columbia River** adult **fall chinook** in thousands of fish. (Page 2 of 3)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
LRH	1984	70.4	89.0	102.4	0.69	0.87
	1985	81.5	86.7	111.0	0.73	0.78
	1986	171.6	173.9	154.8	1.11	1.12
	1987	294.9	298.7	344.1	0.86	0.87
	1988	267.7	246.5	309.9	0.86	0.80
	1989	104.9	97.5	130.9	0.80	0.74
	1990	68.5	65.5	60.0	1.14	1.09
	1991	71.4	73.1	62.7	1.14	1.17
	1992	113.2	121.5	62.6	1.81	1.94
	1993	79.3	77.7	52.3	1.52	1.49
	1994	36.1	46.5	53.6	0.67	0.87
	1995	35.8	42.4	46.4	0.77	0.91
	1996	37.7	48.3	75.5	0.50	0.64
	1997	54.2	68.7	57.4	0.94	1.20
	1998	19.2	22.5	45.3	0.42	0.50
	1999	34.8	38.2	40.0	0.87	0.96
	2000	23.7	26.4	27.0	0.88	0.98
	2001	32.2	30.5	94.3	0.34	0.32
	2002	137.6	133.0	156.4	0.88	0.85
	2003	115.9	116.9	155.0	0.75	0.75
	2004	77.1	79.0	108.9	0.71	0.73
	2005	74.1	-	-	-	-
SCH	1984	21.3	27.0	47.5	0.45	0.57
	1985	34.9	37.1	33.2	1.05	1.12
	1986	16.0	16.2	16.6	0.96	0.98
	1987	9.1	9.2	9.1	1.00	1.01
	1988	6.5	5.9	12.0	0.54	0.49
	1989	29.5	23.0	26.8	1.10	0.86
	1990	27.3	23.7	18.9	1.44	1.25
	1991	56.3	61.4	52.4	1.07	1.17
	1992	40.9	41.3	29.5	1.39	1.40
	1993	19.9	18.2	16.8	1.18	1.08
	1994	20.2	28.9	18.5	1.09	1.56
	1995	17.5	22.5	33.8	0.52	0.67
	1996	27.6	35.4	33.1	0.83	1.07
	1997	21.9	25.7	27.4	0.80	0.94
	1998	14.2	14.2	20.2	0.70	0.70
	1999	65.8	61.0	50.2	1.31	1.22
	2000	21.9	26.9	20.5	1.07	1.31
	2001	56.6	61.9	125.0	0.45	0.50
	2002	144.4	136.0	160.8	0.90	0.85
	2003	96.9	101.9	180.6	0.54	0.56
	2004	138.0	150.0	175.3	0.79	0.86
	2005	114.1	-	-	-	-

TABLE II-8. **Predicted and postseason** returns of **Columbia River** adult **fall chinook** in thousands of fish. (Page 3 of 3)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
MCB	1990	69.5	69.3	58.9	1.18	1.18
	1991	48.4	48.5	35.4	1.37	1.37
	1992	42.5	40.7	31.1	1.37	1.31
	1993	33.0	32.3	27.5	1.20	1.17
	1994	23.9	26.7	33.7	0.71	0.79
	1995	25.0	30.0	34.2	0.73	0.88
	1996	40.8	43.2	59.7	0.68	0.72
	1997	72.1	61.9	59.0	1.22	1.05
	1998	47.8	44.9	36.8	1.30	1.22
	1999	38.3	27.7	50.7	0.76	0.55
	2000	50.6	61.6	36.8	1.38	1.67
	2001	43.5	45.3	76.4	0.57	0.59
	2002	96.2	91.8	108.4	0.89	0.85
	2003	104.8	94.6	150.2	0.70	0.63
	2004	90.4	88.8	117.6	0.77	0.76
	2005	89.4	-	-	-	-

a/ March preseason forecasts are ocean escapements based on terminal run size and stock-specific cohort relationships affected by the historical "normal" ocean fisheries during the brood year data base time period (generally 1979-2000).

b/ STT modeled forecasts adjust March preseason forecasts for Council-adopted ocean regulations each year and should provide a more accurate estimate of expected ocean escapement.

2005 Stock Status

The preliminary forecast for 2005 URB fall chinook ocean escapement is 352,200 adults, which includes a record high forecast of the age-4 component. If the forecast is realized, it would be about 95% of last year's return and about 1.7 times greater than the recent 10-year average of 212,610.

No preseason forecast for 2005 ocean escapement of ESA-listed Snake River wild fall chinook is currently available. However, the Columbia River technical staffs are expected to develop a run size estimate for this stock prior to the April Council meeting.

Ocean escapement of LRW fall chinook in 2005 is forecast at 20,200 adults. If the forecast is realized, it would be about 90% of last year's return and about 1.3 times greater than the recent 10-year average return of 15,260.

The preliminary forecast for 2005 ocean escapement of LRH fall chinook is for a return of 74,100 adults, which would be 68% of last year's return and 90% of the recent 10-year average of 80,620.

Ocean escapement of SCH fall chinook in 2005 is forecast at 114,100 adults. If the forecast is realized, it would be about 65% of last year's return and about 1.4 times greater than the recent 10-year average of 82,690.

The preliminary forecast for the 2005 ocean escapement of MCB fall chinook is 89,400 adults. If the forecast is realized, it would be about 76% of last year's return and about 1.2 times the recent 10-year average of 73,100. The MCB chinook are primarily returns from hatchery releases of bright fall chinook stock in the area downstream from McNary Dam, although some natural spawning in tributaries between Bonneville and John Day dams also occurs.

Evaluation of 2004 Regulations on 2005 Stock Abundance

Applying 2004 regulations to the projected 2005 abundance of Columbia River fall chinook would result in ocean escapements of all five major stock units meeting spawning escapement goals. Compared to 2004, ocean escapement in 2005 is expected to be about the same for URB and LRW and lower for LRH, SCH, and MCB stocks.

Washington Coastal Chinook

Predictor Description and Past Performance

Because Council fisheries have only minor impacts on Washington coastal chinook stocks, preseason abundance estimates are not provided, and these stocks are not included in the preseason fishery impact assessment reports prepared by the STT.

2005 Stock Status

The 2005 Willapa Bay hatchery fall chinook ocean escapement abundance forecast is 17,400, which is up from the 2004 prediction of 14,700. The 2005 natural fall chinook ocean escapement abundance forecast is 3,200, down from last year's 4,100 prediction.

Puget Sound Chinook

Run-size expectations for various Puget Sound stock management units are listed in Table I-1. A comparison of preseason and postseason forecasts for recent years is detailed in Table II-9. The STT has not undertaken a review of the methods employed by state and tribal staffs in preparing these abundance forecasts. Methodologies for estimates are described in the annual Puget Sound management reports (starting in 1993, reports are available by Puget Sound management unit, not by individual species). Forecasts for Puget Sound stocks generally assume production is dominated by age-four adults. Puget Sound chinook were listed as threatened under the ESA in March 1999. Southern U.S. fisheries that impact Puget Sound chinook are constrained by terms of a Resource Management Plan (RMP), and are exempted from ESA Section 9 take prohibitions under Limit 6 of the 4(d) rule.

2005 Stock Status

Spring Chinook

Spring chinook originating in Puget Sound are expected to remain depressed. Runs in the Nooksack, Skagit, White, and Dungeness rivers are of particular concern.

Summer/Fall Chinook

Preliminary information for Puget Sound summer/fall stocks indicates the total 2005 return (215,400) is expected to be slightly lower than the 2004 preseason forecast of 229,700. The 2005 natural chinook return forecast of 64,700 is similar to the 2004 forecast of 62,900. Changes in the abundance of individual stocks from various production areas are detailed in Table I-1.

Natural stocks from Puget Sound have experienced improved survival in recent years, but not to the extent that it can be labeled as a trend. Good ocean conditions are assumed to be largely responsible for the improvement. Fishery management for Puget Sound chinook has changed from an escapement goal basis to the use of stock specific exploitation rates and "critical abundance thresholds." This new approach is evaluated on an annual basis through the RMP.

Evaluation of 2004 Regulations on 2005 Stock Abundance

Council fisheries north of Cape Falcon have only a minor impact on most stocks that originate in Washington coastal and Puget Sound rivers. These stocks have northerly marine distribution patterns and are therefore impacted primarily by Canadian and Alaskan fisheries. An evaluation of 2004 Council area regulations on projected 2005 abundance would not provide a useful comparison of ocean escapement.

TABLE II-9. Comparison of **preseason and postseason** forecasts **of Puget Sound** run size for **summer/fall chinook**.[a/] (Page 1 of 2)

Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
	Nooksack-Samish - Hatchery and Natural			**East Sound Bay - Hatchery**			**Skagit - Hatchery**			**Skagit - Natural**		
1993	50.4	32.9	1.53	3.2	3.8	0.84	1.0	1.4	0.71	14.0	7.0	2.00
1994	46.6	28.1	1.66	3.2	0.8	4.00	1.3	4.3	0.30	8.4	6.6	1.27
1995	38.5	22.2	1.73	3.5	0.2	17.50	1.6	3.3	0.48	5.0	9.6	0.52
1996	27.0	29.4	0.92	1.7	0.7	2.43	1.0	1.2	0.83	7.1	12.2	0.58
1997	34.0	34.2	0.99	1.2	1.2	1.00	0.1	0.0	-	6.4	6.2	1.03
1998	28.0	29.5	0.95	0.5	0.3	1.67	0.0	0.1	-	6.6	14.9	0.44
1999	27.0	40.9	0.66	2.3	0.3	7.67	0.0	0.0	-	7.6	5.2	1.46
2000	19.0	33.5	0.57	5.0	0.1	50.00	0.0	0.2	-	7.3	17.2	0.42
2001	34.9	63.9	0.55	1.6	0.1	16.00	0.0	0.1	-	9.1	14.0	0.65
2002	52.8	53.4	0.99	1.6	0.7	2.29	0.0	0.0	-	13.8	19.9	0.69
2003	45.8	30.3[b/]	1.51	1.6	0.2[b/]	8.00	0.0	0.2[b/]	-	13.7	9.9[b/]	1.38
2004	34.2	NA	NA	0.8	NA	NA	0.5	NA	-	20.3	NA	NA
	Stillaguamish - Natural			**Snohomish - Hatchery**			**Snohomish - Natural**			**Tulalip - Hatchery**		
1993	NA	1.3	NA	1.6	2.7	0.59	4.9	5.7	0.86	2.8	1.4	2.00
1994	NA	1.3	NA	1.8	5.4	0.33	4.5	5.0	0.90	2.8	1.9	1.47
1995	1.8	1.4	1.29	2.2	6.0	0.37	4.3	5.9	0.73	2.3	4.1	0.56
1996	1.3	2.3	0.57	6.7	9.2	0.73	4.2	8.0	0.53	2.7	4.0	0.68
1997	1.6	1.2	1.33	7.7	2.7	2.85	5.2	4.4	1.18	4.0	8.6	0.47
1998	1.6	1.5	1.07	6.5	1.1	5.91	5.6	6.4	0.88	2.5	7.2	0.35
1999	1.5	1.1	1.36	7.8	1.6	4.88	5.6	4.8	1.17	4.5	15.2	0.30
2000	2.0	1.7	1.18	6.2	1.5	4.13	6.0	6.1	0.98	5.0	8.4	0.60
2001	1.7	1.4	1.21	4.1	0.7	5.86	5.8	8.4	0.69	5.5	5.1	1.08
2002	2.0	1.6	1.25	6.8	2.6	2.62	6.7	7.3	0.92	5.8	4.4	1.32
2003	2.0	1.0[b/]	2.00	9.4	0.2[b/]	47.00	5.5	5.6[b/]	0.98	6.0	7.5[b/]	0.80
2004	2.2	NA	NA	10.1	NA	NA	15.7	NA	-	7.6	NA	NA

TABLE II-9. Comparison of **preseason and postseason** forecasts **of Puget Sound** run size for **summer/fall chinook**.[a/] (Page 2 of 2)

Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
	South Puget Sound - Hatchery			**South Puget Sound - Natural**			**Strait of Juan de Fuca - Hatchery**			**Strait of Juan de Fuca - Natural**		
1993	61.8	36.8	1.68	26.5	19.8	1.34	0.7	0.2	3.50	3.1	2.4	1.29
1994	52.7	48.9	1.08	18.0	29.9	0.60	3.9	1.6	2.44	1.0	0.5	2.00
1995	49.6	74.5	0.67	21.7	34.5	0.63	3.0	0.1	30.00	0.9	2.7	0.33
1996	51.9	58.3	0.89	19.0	35.8	0.53	2.8	0.2	14.00	0.9	3.1	0.29
1997	65.1	46.5	1.40	18.2	20.6	0.88	2.2	0.3	7.33	0.8	3.5	0.23
1998	67.8	54.5	1.24	21.8	27.7	0.79	1.7	1.7	1.00	0.9	1.9	0.47
1999	59.4	83.6	0.71	19.6	17.0	1.15	1.9	0.7	2.71	0.9	2.7	0.33
2000	77.5	55.8	1.39	17.5	13.9	1.26	2.0	1.2	1.67	1.1	1.7	0.65
2001	73.7	96.4	0.76	16.2	20.2	0.80	0.0	1.7	-	3.5	2.0	1.75
2002	90.8	85.0	1.07	16.9	21.5	0.79	0.0	0.0	-	3.6	3.7	0.97
2003	86.6	75.9[b/]	1.14	19.6	15.3[b/]	1.28	0.0	0.0[b/]	-	3.4	4.7[b/]	0.72
2004	86.5	NA	NA	17.5	NA	NA	0.0	NA	NA	3.5	NA	NA
1993	**Hood Canal - Hatchery and Natural**											
1994	11.7	4.8	2.44									
1995	11.5	3.8	3.03									
1996	3.9	9.4	0.41									
1997	9.0	8.2	1.10									
1998	2.7	7.9	0.34									
1999	6.7	16.3	0.41									
2000	14.0	29.6	0.47									
2001	19.2	21.3	0.90									
2002	25.3	19.3	1.31									
2003	24.0	31.5[b/]	0.76									
2004	29.6	NA	NA									

a/ Puget Sound run size is defined as the run available to Puget Sound net fisheries. Does not include fish caught by troll and recreational fisheries inside Puget Sound.
b/ Preliminary.

CHAPTER III
COHO SALMON ASSESSMENTS

COLUMBIA RIVER AND OREGON/CALIFORNIA COASTAL COHO (OREGON PRODUCTION INDEX AREA)

The majority of coho harvested in the OPI area originate from stocks produced in rivers located within the OPI area (Leadbetter Point, Washington, to the U.S./Mexico border). These stocks include hatchery and natural production from the Columbia River, Oregon Coast, and northern California.

The Council adopted revised abundance estimation predictors in 1987 for use starting in 1988, which should more accurately forecast the abundance of individual stock components originating in the OPI area. These stock components are; (1) public hatchery (OPIH), (2) Oregon coastal natural river (OCNR), (3) Oregon coastal natural lake (OCNL), (4) private hatchery (PRIH), and (5) hatchery smolt production from the Oregon coastal Salmon Trout Enhancement Program (STEP).

A stratified random sampling (SRS) study implemented in 1990 indicated an overestimation of annual OCN spawner escapement, which had previously been based on index surveys. Because OPI area ocean impacts are proportioned to the ocean escapements of various OPI components, a reduction in OCN spawner escapement indicated traditional OCN abundances were overestimated, while traditional abundance estimates for other OPI area stocks were underestimated. Starting in 1992, the Council adopted an abundance adjustment procedure for use in assessing fishery impacts. This procedural change, based on improved estimates of OCN spawner escapements, adjusted traditional index abundances of the other OPI area stocks. To achieve targeted exploitation rates and spawner escapement goals, the various OPI area stock abundance index predictions were scaled in the Coho FRAM to reflect the results of the ongoing OCN spawner study and are referred to as SRS abundances. In 1998, after eight years of SRS abundance estimates, the historic OPI data set was rescaled to reflect the revised OCN abundance estimates.

Beginning in 1999, with the availability of a long-term data set in SRS values, all five OPI area stock abundances were projected in SRS accounting. Direct comparisons of 2005 abundance forecasts with recent year SRS abundance projections, both preseason and postseason, are reported in Table III-1. All fishery impacts and escapements from the coho FRAM are reported in SRS values.

Public Hatchery Coho

OPI area public hatchery coho smolt production occurs primarily in Columbia River facilities and net pens. Several facilities located in Oregon coastal rivers and in the Klamath River Basin, California, collectively produce fewer coho. OPI area smolt releases since 1960 are reported by geographic area in Appendix B, Table B-1.

Predictor Description

Since 1988, the OPIH stock predictor was a multiple linear regression with the following variables: Columbia River jacks (Jack CR), Oregon coastal and Klamath River Basin jacks (Jack OC), and a correction term for delayed smolts released from Columbia River hatcheries (Jack CR * [SmD/SmCR]) to predict public hatchery stock abundance.

TABLE III-1. Preliminary 1996-2005 **preseason and postseason coho** stock **Stratified Random Sampling abundance** estimates for Oregon production index area stocks in thousands of fish. (Page 1 of 2)

Stock	Year	Preseason	Postseason[a/]	Preseason/Postseason
Oregon Production Index Area Hatchery Total	1996	309.2	182.6	1.69
	1997	376.1	215.3	1.75
	1998	118.4	203.6	0.58
	1999	559.2	319.6	1.75
	2000	671.4	677.1	0.99
	2001	1,707.6	1,395.5	1.22
	2002	361.7	660.1	0.55
	2003	863.1	952.5	0.91
	2004	623.9	634.6	0.98
	2005	389.9	-	-
Columbia River Early	1996	142.2	98.0	1.45
	1997	206.9	129.8	1.59
	1998	63.8	126.4	0.50
	1999	325.5	174.9	1.86
	2000	326.3	378.0	0.86
	2001	1,036.5	815.9	1.27
	2002	161.6	324.7	0.50
	2003	440.0	645.7	0.68
	2004	313.6	389.0	0.81
	2005	284.6	-	-
Columbia River Late	1996	114.4	30.8	3.71
	1997	86.5	53.7	1.61
	1998	24.9	47.3	0.53
	1999	140.9	120.7	1.17
	2000	278.0	260.1	1.07
	2001	491.8	488.3	1.01
	2002	143.5	271.8	0.53
	2003	377.9	248.0	1.52
	2004	274.7	203.0	1.35
	2005	78.0	-	-
Oregon Coastal North of Cape Blanco	1996	38.5	28.0	1.38
	1997	60.4	19.0	3.18
	1998	21.6	19.7	1.10
	1999	59.4	14.4	4.13
	2000	48.5	23.4	2.07
	2001	127.3	46.9	2.71
	2002	36.6	41.6	0.88
	2003	29.3	34.5	0.85
	2004	16.6	21.7	0.77
	2005	11.5	-	-
Oregon and California Coastal South of Cape Blanco	1996	14.2	25.8	0.55
	1997	22.3	12.8	1.74
	1998	8.1	10.2	0.79
	1999	33.4	9.6	3.48
	2000	18.6	15.6	1.19
	2001	52.0	46.0	1.13
	2002	20.0	22.0	0.91
	2003	15.9	24.3	0.65
	2004	19.0	29.9	0.64
	2005	15.8	-	-

TABLE III-1. Preliminary 1996-2005 **preseason and postseason coho** stock **Stratified Random Sampling abundance** estimates for Oregon production index area stocks in thousands of fish. (Page 2 of 2)

Stock	Year	Preseason	Postseason[a/]	Preseason/Postseason
Oregon Coastal Natural	1996	63.2	86.1	0.73
	1997	86.4	27.8	3.11
	1998	47.2	29.2	1.62
	1999	60.7	51.9	1.17
	2000	55.9	69.0	0.81
	2001	50.1	163.2	0.31
	2002	71.8	304.5	0.24
	2003	117.9	278.8	0.42
	2004	150.9	197.0	0.77
	2005	152.0	-	-
Salmon Trout Enhancement Program	1996	0.4	1.2	0.33
	1997	1.3	0.3	4.33
	1998	0.2	0.3	0.67
	1999	0.7	0.4	1.75
	2000	0.6	0.5	1.20
	2001	1.0	1.4	0.71
	2002	0.6	3.0	0.20
	2003	3.6	3.6	1.00
	2004	3.1	1.0	3.10
	2005	1.0	-	-

a/ Postseason estimates are based on preliminary data, and not all stocks have been updated with final estimates.

The OPIH stock predictor is partitioned into Columbia River early and late stocks and coastal stocks north and south of Cape Blanco, Oregon, based on the proportion of the 2004 jack returns to each area adjusted for stock specific maturation rates. The northern OPIH coastal stock is comprised of hatchery production from the central Oregon Coast. The southern OPIH coastal stock is comprised of hatchery production from the Rogue River basin in southern Oregon and the Klamath and Trinity basins in northern California.

For the 2005 abundance prediction, the data base includes 1970-2004 recruits, excluding 1983 when *El Niño* impacted adult returns. It also includes 1969-2003 jack returns, excluding 1982, also due to *El Niño* influence. The model is:

OPIH(t) = a+b*Jack CR(t-1)+c*Jack OC(t-1)+d*(Jack CR(t-1)*[SmD(t-1)/SmCR(t-1)])

Where:

a = -115.205571
b = 19.399947
c = 17.071270
d = 31.518657
adjusted r^2 = 0.96

The OPIH stock data set and a definition of the above terms are presented in Appendix B, Table B-2.

Predictor Performance

Recent year OPIH stock preseason abundance predictions, partitioned by production area and as a total, are compared with postseason estimates in Table III-1. The 2004 preseason abundance prediction of 623,900 OPIH coho was 97% of the preliminary postseason estimate of 643,600 coho.

Since 1983, the OPIH predictor has often performed poorly, due principally to high interannual variability in the jack to adult ratios.

2005 Stock Status

Using the appropriate values from Appendix B, Table B-2, the OPIH abundance prediction for 2005 is 389,900 coho, 63% of the 2004 prediction and 61% of the preliminary 2004 postseason estimate. The decrease in predicted OPIH coho from 2004 to 2005 is primarily due to lower hatchery jack returns in 2004 relative to 2003.

Oregon Coastal Natural Coho

The OCN stock is composed of natural production north of Cape Blanco, Oregon from OCNR and OCNL systems, which are predicted independently.

Predictor Description

Oregon Coastal Natural Rivers

From 1988-1993 the abundance of OCNR index coho was predicted using a modified Ricker spawner-recruit model. The predictor related OCNR recruits to the parent brood stock size incorporating an adjustment for ocean survival based on OPI hatchery smolt to jack survival the previous year. Due to a tendency to overpredict abundances, the data base in the predictor was shortened from 1970-1991 to 1980-1991 starting with 1992 predictions.

Because of concern that the adopted OCNR model did not adequately incorporate environmental variability, an alternative model was used to predict the 1994 and 1995 index abundances. The model used ocean upwelling, sea surface temperatures, and year to predict OCNR index coho abundance. The year term was included in the model to reflect an observed decline in stock productivity.

For 1996-1998, the environmental based model without the year component was used in predicting OCNR stock abundances. In addition, the predictions were in SRS rather than traditional index accounting. The OCNR environmental variables are annual deviation from the mean April-June Bakun upwelling index at 42° N latitude (UpAnom), and annual deviation from the mean January sea surface temperature at Charleston, Oregon (JanAnom).

For 1999-2002, the environmental-based model with the year component included was used to predict OCNR stock abundances.

Since 2003, the same environmental-based model without the year component that was used for 1996-1998 was used in predicting OCNR abundance. The model is:

$$\ln(\text{Recruits}(t)) = a + b*\text{UpAnom}(t-1) + c*\text{JanAnom}(t)$$

Where:

a	=	4.721254
b	=	0.008261
c	=	-0.367755
adjusted r^2	=	0.35

The OCNR stock data set and a definition of the above terms are presented in Appendix B, Table B-4.

Oregon Coastal Natural Lakes

Since 1988, the abundance of OCNL index coho has been predicted using the most recent three-year average adult stock abundance. OCNL coho production occurs from three lake systems (Tenmile, Siltcoos, and Tahkenitch lake systems). Production from these systems has declined substantially from the levels observed during 1950-1973, but has been steadily increasing in recent years. The 2004 abundance was estimated to be 21,800.

Predictor Performance

Recent-year OCN stock preseason SRS abundance predictions are compared to postseason estimates in Table III-1. The OCN predictor has under estimated abundance since 2000. The 2004 preseason abundance prediction of 150,900 OCN coho was 77% of the preliminary postseason estimate of 197,000 coho.

2005 Stock Status

The 2005 preseason prediction for OCN (river and lake systems combined) is 152,000 coho, 101% of the 2004 preseason prediction and 77% of the 2004 postseason estimate (Table III-1). The 2005 preseason SRS prediction for OCNR and OCNL components are 133,100 and 18,900 coho, respectively.

Private Hatchery Coho

There have been no Oregon coastal PRIH coho smolt releases since 1990. Thus, there is no PRIH recruitment in 2005.

Salmon Trout Enhancement Hatchery Coho Smolt Program

Predictor Description

From 1988 to 2004, preseason abundance predictions for Oregon coastal STEP index coho smolt production facilities have been based on the Council-approved procedure. This procedure involved calculating the smolt to adult survival rate for the current return and multiplying it by the ratio of the current OPI jack survival to the previous year's OPI jack survival.

The 2005 prediction used the observed 2001 brood smolt to adult survival rate applied to the 2002 brood smolt production.

Predictor Performance

Recent-year STEP preseason abundance predictions are compared to postseason estimates in Table III-1. The 2004 preliminary postseason estimate of 1,000 coho was 32% of the preseason abundance prediction.

2005 Stock Status

The 2005 preseason STEP index abundance prediction is 1,000 coho (Table III-1). The 2005 prediction is below the 2004 preseason prediction of 3,100 coho, but equal to the 2004 preliminary postseason return estimate.

Oregon Production Index Area Summary of 2005 Stock Status

The 2005 combined OPI area stock abundance is predicted to be 542,900 coho, which is 79% of the 2004 preseason prediction of 777,900 coho and 65% of the 2004 preliminary postseason estimate of 841,600 coho. The 2005 OPI area predictions can be compared to historical abundances in Table III-2.

WASHINGTON COASTAL AND PUGET SOUND COHO STOCKS

Predictor Description and Past Performance

A variety of preseason abundance estimators currently are employed for Washington coastal and Puget Sound coho stocks (Table I-2). These estimators are used to forecast preseason abundance of adult ocean recruits.

The performance of preseason abundance forecasts (adult ocean recruits) cannot be evaluated at this time because postseason run reconstructions for U.S. and Canadian coho production units have not been completed. A comparison of expected preseason and postseason ocean escapements for Washington coastal and Puget Sound stocks in recent years is presented in Tables III-3 and III-4. Postseason estimates of 2004 ocean escapements for some of these stocks are not available at this time. The comparison of preseason and postseason estimates of ocean escapement reflects annual errors in abundance estimates, deviations in ocean fisheries from preseason expectations, and variations in ocean distributions of stocks as described in the introduction. Fishery impact levels anticipated preseason may be substantially different than those that actually occur.

TABLE III-2. Oregon production index **(OPI) area coho harvest impacts, spawning, abundance, and exploitation rate** estimates by SRS accounting in thousands of fish.[a/] (Page 1 of 1)

Year or Average	Ocean Fisheries[b/]		Oregon and California Coastal Returns						
	Troll	Sport	Hatcheries and Freshwater Harvest[c/]	OCN Spawners	Private Hatcheries	Columbia River Returns	Abundance	Ocean Exploitation Rate Based on OPI Abundance[d/]	OCN Exploitation Rate Based on Postseason FRAM[e/]
1970-1975	1,629.6	558.4	45.8	55.2	-	460.4	2,749.3	0.80	-
1976	2,936.1	977.7	62.6	40.7	-	337.0	4,354.1	0.90	-
1977	664.4	412.1	21.4	19.5	4.2	93.8	1,215.4	0.89	-
1978	1,104.2	524.6	12.6	19.8	12.3	307.5	1,981.0	0.83	-
1979	1,056.6	334.4	27.4	45.0	49.2	276.5	1,789.1	0.79	-
1980	506.9	526.4	32.1	30.3	38.7	301.6	1,436.0	0.73	-
1981	830.9	339.9	34.1	32.6	117.8	170.2	1,525.5	0.81	-
1982	740.9	300.4	37.1	76.2	184.7	453.1	1,792.4	0.62	-
1983	429.6	275.0	18.2	22.8	133.9	111.2	990.7	0.79	-
1984	95.8	174.2	51.2	74.5	115.4	425.9	937.0	0.32	-
1985	166.4	280.4	45.4	73.9	332.0	367.2	1,265.3	0.43	-
1986	643.5	320.6	81.8	70.0	453.7	1,549.1	3,118.7	0.34	-
1987	469.1	296.2	45.3	30.1	119.3	316.6	1,276.6	0.60	-
1988	844.7	297.2	62.4	56.8	116.1	670.8	2,048.0	0.56	-
1989	646.9	425.5	62.3	46.4	46.9	712.8	1,940.8	0.55	-
1990	277.6	357.1	30.6	20.9	35.6	196.7	918.5	0.69	-
1991	450.6	469.9	84.0	36.4	35.1	954.3	2,030.3	0.45	-
1992	67.5	256.5	53.8	40.6	-	217.7	636.1	0.51	-
1993	13.2	140.8	41.5	54.5	-	114.2	364.2	0.42	-
1994	2.7	3.0	30.8	43.3	-	169.1	248.9	0.02	0.07
1995	5.4	43.5	40.0	52.5	-	75.2	216.6	0.23	0.12
1996	7.0	31.8	48.9	73.0	-	104.6	265.3	0.15	0.08
1997	5.5	22.4	27.9	22.7	-	145.3	223.8	0.13	0.12
1998	3.5	12.6	30.5	30.9	-	164.5	242.0	0.07	0.08
1999	3.6	41.8	24.4	47.4	-	273.6	389.7	0.12	0.09
2000	25.9	74.2	38.5	66.8	-	549.6	756.0	0.13	0.07
2001	38.0	216.8	86.5	167.7	-	1,108.1	1,617.0	0.16	0.07
2002	15.0	118.8	59.5	253.5	-	511.6	958.3	0.14	0.12
2003	28.8	253.0	50.7	222.4	-	683.7	1,265.8	0.22	0.14
2004[f/]	26.2	159.3	42.1	168.7	-	446.0	841.6	0.22	0.15

a/ The OPI area includes ocean and inside harvest impacts and escapement to streams and lakes south of Leadbetter Pt., Washington.
b/ Includes estimated nonretention mortality: troll fishery--hook-and-release mortality for 1982-2004 and drop-off mortality for all years; sport fishery--hook-and-release mortality for 1994-2004 and drop-off mortality for all years.
c/ Includes returns from Salmon-Trout Enhancement Program (STEP) smolt releases.
d/ Ocean fishery impacts on private hatchery stock and returns to private hatcheries are excluded in calculating the OPI area stock aggregate ocean exploitation rate index.
e/ 2001, 2002, 2003, and 2004 based on preseason FRAM estimate.
f/ Preliminary.

TABLE III-3. **Preseason and postseason** estimates of ocean **escapements** for selected **Washington coastal** adult **natural coho** stocks in thousands of fish. (Page 1 of 1)

	Quillayute River Fall			Hoh River			Queets River			Grays Harbor[a/]		
Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1984	7.0	11.0	0.64	2.7	7.7	0.35	5.2	9.7	0.54	28.7	103.8	0.28
1985	19.2	15.8	1.22	6.6	5.2	1.27	11.3	6.0	1.88	56.4	25.1	3.25
1986	6.1	17.1	0.36	3.9	6.4	0.61	5.2	5.8	0.90	51.6	33.3	1.55
1987	11.7	23.8	0.49	5.5	7.2	0.76	9.0	8.9	1.01	103.3	55.7	1.85
1988	10.4	9.1	1.14	2.0	2.6	0.77	4.7	4.5	1.04	26.4	58.0	0.46
1989	14.5	11.1	1.31	5.7	5.4	1.06	6.2	5.4	1.15	43.0	60.9	0.71
1990	15.2	9.5	1.60	5.1	4.5	1.13	5.9	7.1	0.83	48.3	57.3	0.84
1991	8.8	10.6	0.83	3.4	5.4	0.63	7.9	8.6	0.92	138.0	108.7	1.27
1992	12.5	13.6	0.92	4.9	5.0	0.98	5.6	7.0	0.80	48.4	40.9	1.18
1993	7.6	4.7	1.62	4.8	1.9	2.53	6.5	5.4	1.20	84.7	37.3	2.27
1994	7.0	6.4	1.09	3.0	1.4	2.14	3.6	1.2	3.00	31.3	11.8	2.65
1995	8.5	14.3	0.59	4.4	5.4	0.81	7.2	7.3	0.99	64.4	58.9	1.09
1996	9.2	14.6	0.63	3.0	5.8	0.52	5.4	10.7	0.50	82.7	82.4	1.00
1997	5.1	5.0	1.02	1.6	1.4	1.14	2.4	2.0	1.20	14.8	18.9	0.78
1998	7.4	17.0	0.44	3.2	5.2	0.62	4.5	4.6	0.98	27.1	41.2	0.66
1999	12.8	19.5	0.66	2.8	6.3	0.44	3.7	5.0	0.74	50.3	38.9	1.29
2000	8.2	17.7	0.46	3.3	8.8	0.38	2.5	8.3	0.30	44.2	40.8	1.08
2001	20.6	36.7	0.56	7.6	14.8	0.51	10.6	27.8	0.33	46.6	73.5	0.63
2002	18.5	34.7	0.53	6.9	11.2	0.62	10.2	16.1	0.63	50.3	117.2	0.43
2003	21.2	25.2	0.84	10.4	8.1	1.28	19.6	11.2	1.75	52.3	NA	NA
2004	17.7	20.9[b/]	0.85	6.6	3.4[b/]	1.94	14.7	11.3[b/]	1.30	101.1	NA	NA

a/ The source for postseason return estimates is Washington Department of Fish and Wildlife.
b/ Preliminary.

TABLE III-4. **Preseason and postseason** estimates of ocean **escapements** for selected **Puget Sound** adult **natural coho** stocks in thousands of fish. (Page 1 of 1)

	Skagit River			Stillaguamish River			Hood Canal		
Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1984	29.6	37.2	0.80	NA	26.9	NA	NA	57.5	NA
1985	26.1	31.3	0.83	NA	34.4	NA	NA	38.5	NA
1986	43.5	73.4	0.59	37.0	49.9	0.74	NA	82.2	NA
1987	33.0	41.2	0.80	29.7	46.3	0.64	NA	71.7	NA
1988	29.6	29.9	0.99	24.5	35.4	0.69	18.2	15.5	1.17
1989	31.2	27.6	1.13	24.5	13.5	1.81	36.8	25.5	1.44
1990	37.6	25.9	1.45	30.8	34.1	0.90	43.9	14.2	3.09
1991	40.8	11.8	3.46	32.9	11.3	2.91	17.6	15.3	1.15
1992	35.7	9.5	3.76	18.7	18.0	1.04	10.1	19.9	0.51
1993	28.1	14.5	1.94	24.5	10.6	2.31	39.5	16.7	2.37
1994	17.9	30.5	0.59	10.2	30.3	0.34	13.5	57.0	0.24
1995	30.0	16.2	1.85	32.7	20.4	1.60	19.3	41.1	0.47
1996	26.7	8.7	3.07	29.8	12.2	2.44	15.4	37.3	0.41
1997	34.2	40.2	0.85	15.7	13.8	1.14	38.1	99.8	0.38
1998	41.1	85.9	0.48	37.7	30.7	1.23	87.3	122.4	0.71
1999	53.4	37.2	1.44	27.3	7.5	3.64	45.2	18.6	2.43
2000	24.7	71.6	0.35	15.0	32.5	0.46	50.4	40.7	1.24
2001	46.9	115.6	0.41	18.1	80.6	0.22	40.6	104.6	0.39
2002	79.9	61.0[a/]	1.31	14.5	30.4[a/]	0.48	25.6	85.4[a/]	0.30
2003	97.9	87.8[a/]	1.12	27.7	49.8[a/]	0.56	25.8	196.5[a/]	0.13
2004	130.9	NA	NA	26.6	NA	NA	79.7	NA	NA

a/ Preliminary.

2005 Stock Status

Washington Coastal Coho

Willapa Bay

This is the fifth year hatchery and wild coho forecasts were estimated independently. The 2005 Willapa Bay hatchery coho abundance forecast is 56,400 ocean recruits, a 2% increase from the 2004 preseason forecast of 55,000. The hatchery forecast is based on 2004 smolt releases multiplied by the 1998-2004 average terminal return per release, expanded for the 1999-2002 average ocean exploitation rate for Forks Creek Hatchery releases. The natural coho forecast is 35,900 ocean recruits, based on the 1998-2004 average terminal run size of natural fish expanded for the 1999-2002 average ocean exploitation rate for unmarked Forks Creek Hatchery releases.

Grays Harbor

Preseason abundance forecasts are made for natural fish throughout the system and for hatchery fish returning to three freshwater rearing complexes and three saltwater net-pen sites. The forecasts include returns expected from numerous volunteer production projects. The abundance forecast for Grays Harbor natural stock coho for 2005 is 91,100 ocean recruits. The forecast for hatchery stock ocean abundance is 54,400 adults.

The natural coho forecast was generated by multiplying the 2002 escapement by the average terminal return per spawner for brood years with comparable escapement levels (1970, 1971, 1974, 1984, 1988, 1991, 1996, and 2001) and then expanding to ocean abundance using the 1996-1999 brood year average preterminal fishery exploitation rate for Bingham Creek wild CWT releases. The hatchery forecast is based on 2004 releases multiplied by the 1997-2003 average return per release, expanded to ocean abundance using the 1996-1999 brood year average preterminal exploitation rate for hatchery CWT releases.

Quinault River

The 2005 forecast for Quinault natural coho is 44,900 ocean recruits, an 11% decrease from the 2004 projected level of 50,500. This estimate represents the 2002 brood year escapement (12,213) multiplied by the 1996-2000 brood year average ocean recruits per spawner (3.67).

The Quinault hatchery coho forecast is 33,600 ocean recruits, an increase of 84% compared to the 2004 forecast level of 18,200. The forecast is derived from the mean 1996-2000 brood year observed marine survival rates (0.051) and 2002 brood year smolt release (657,000). Approximately 528,300 (80%) of the release was marked with an adipose fin clip.

Queets River

The 2005 Queets natural coho forecast is 17,100 ocean recruits, a decrease of 8% compared to the 2004 forecast level of 18,500. This forecast represents the estimated smolt production (443,600) multiplied by the survival predicted by a General Additive Model that incorporates environmental influences on adult survival.

The 2005 forecast for supplemental production is 2,400 ocean recruits, a decrease of 4% from the 2004 forecast level of 2,500. The abundance forecast is based on smolt releases (181,800) multiplied by the 1996-2000 brood year average recruits/release (0.013). Approximately 24% of supplemental releases are adipose fin clipped.

The 2005 Queets hatchery (Salmon River) coho forecast is 17,400 ocean recruits, an increase of 2% compared to the 2004 forecast level of 17,100. This forecast is based on the smolt release of 760,500 multiplied by the 1996-2000 brood year average observed marine survival rate (0.023). Approximately 10% of the fish released from the Salmon River facility were marked with an adipose fin clip.

Hoh River

The Hoh River natural coho forecast is 7,600 ocean recruits, a decrease of 6% compared to the 2004 forecast of 8,100. This forecast is based on estimated smolt production per square mile of watershed (based on Clearwater tributary to the Queets), multiplied by the size of the Hoh watershed, for a total of 190,300 smolts. The total smolt production is then multiplied by 0.04, based on a sea surface temperature to marine survival model.

No hatchery production is projected for the Hoh system for 2005.

Quillayute River

The Quillayute River summer natural and hatchery coho forecasts for 2005 are 800 and 6,100 ocean recruits, respectively. The natural component run size is based on estimated smolt production (18,100) and a projected ocean survival rate of 0.045 based on Bingham Creek jack return data and a sea surface temperature to marine survival model. The hatchery component run forecast is based on a forecast marine survival rate of 0.35 and a release size of 174,300 smolts. The 2005 forecast abundance of natural summer coho is 26% lower than the 2004 forecast, while the hatchery forecast is unchanged from the 2004 forecast level.

The Quillayute River fall natural and hatchery coho forecasts are 18,600 and 22,100 ocean recruits, respectively. The 2005 forecast abundances of natural and hatchery components of Quillayute fall coho are 12% below and 6% above their respective 2004 forecast levels. The forecast for the natural component is based on the estimated smolt production (412,300), multiplied by the projected ocean survival rate of 0.045 derived from Bingham Creek jack return data and a sea surface temperature to marine survival model. The smolt production estimate was derived by; (1) multiplying the 1987, 1988, and 1990 average smolt production for the Quillayute system (306,000) by a scalar derived from smolt estimates for the Clearwater tributary to the Queets and (2) apportioning smolt production to summer and fall stocks based on brood escapements. The scalar value (1.407) represents the ratio between the 2004 estimated smolt production for the Clearwater and the 1987, 1988, and 1990 average. Smolt production for fall and summer components combined was allocated according to brood year spawning escapements to yield smolt estimates of 412,300 and 18,100 for fall and summer stocks, respectively. The hatchery production forecasts are based on average ocean recruits per release (0.035) multiplied by the number of smolts released.

North Washington Coast Independent Tributaries

Production from several smaller rivers and streams along the north Washington Coast (Waatch River, Sooes River, Ozette River, Goodman Creek, Mosquito Creek, Cedar Creek, Kalaloch Creek, Raft River, Camp Creek, Duck Creek, Moclips River, Joe Creek, Copalis River, Conner Creek), which flow directly into the Pacific Ocean, is forecast as an aggregate. Generally, stock assessment programs on these systems are minimal. The 2005 forecast of natural coho production for these independent streams is 8,500 based on a prediction of 500 smolts per square mile of watershed drainage (212,000 smolts based on 424 square miles of watershed) and an expectation for marine survival of 0.04. The marine survival projection was derived from jack-to-adult return information collected at the WDFW Bingham Creek research station.

The hatchery forecast of 5,600 is based on average brood year 1988-2000 marine survivals (0.0244 to December age-2) from the Makah National Fish Hatchery, multiplied by the 2002 brood year release (231,500) from the Makah National Fish Hatchery. Approximately 78% of the 2002 brood year release was marked with an adipose fin clip.

Puget Sound

The 2005 total hatchery and natural coho ocean recruit forecast for the Puget Sound region is 1,009,060; 10% below the year 2004 forecast. The hatchery coho forecast of 463,929 is 8% below the 2004 forecast, and the natural coho forecast of 545,131 is 13% below the 2004 forecast.

Puget Sound hatchery forecasts for 2005 were generally the product of 2002 brood year smolt releases from each facility and a predicted marine survival rate for each facility, typically based on recent year average survival rates derived from CWT recovery information and/or run reconstructions. Forecasts for natural Puget Sound coho stocks were generally derived by measured or predicted smolt production from each major watershed or region, multiplied by stock-specific marine survival rate predictions based on jack return models, recruits/smolt or adult models, or other information.

Strait of Juan de Fuca

The 2005 forecasts for Strait of Juan de Fuca natural and hatchery coho ocean recruits are 20,700 and 26,500, respectively. The natural coho forecast was derived by multiplying the estimated 2002 brood natural smolt production for the region by a predicted marine survival rate of 9.0%. The hatchery forecasts are based on applying hatchery-specific recruitment rate predictions (3.1% for Dungeness, 1.4% for Elwha) to the 2002 BY smolt releases for each hatchery. The recruitment rate predictions are based on recent year averages of cohort reconstruction-based recruits/smolt for the aggregate natural stock, and each hatchery production unit.

Nooksack-Samish

The 2005 forecasts for Nooksack-Samish natural and hatchery coho ocean recruits are 22,697 and 24,540, respectively. The natural coho forecast is the product of projected natural smolt production from each of the stream basins in the region, multiplied by a marine survival rate expectation of 7.0%. The natural coho marine survival rate prediction is based on the average Baker River (Skagit basin) indicator stock CWT based recruits/smolt rate. The hatchery forecasts are based on the 1999-2000 BY average recruits/smolt rate for Kendall Cr. Hatchery (3.9%), applied to the 2002 BY smolt releases.

Skagit

The 2005 forecasts for Skagit River natural and hatchery coho ocean recruits are 61,881 and 9,119 (8,249 from in-river hatchery production, 870 from Oak Harbor Net Pens), respectively. The natural coho forecast is the product of measured smolt production from the Skagit basin multiplied by a marine survival rate expectation of 7.0%. The natural coho marine survival rate is based on the average even brood year (1988-2002) Baker River indicator stock CWT based recruits/smolt rate. The even year average was used due to the observation that both juvenile coho production and marine survival rates have an odd/even year pattern in this basin. The hatchery forecasts are based on the 1988-2000 BY even year average marine survival rate for Cascade Hatchery (2.9%) applied to the 2002 BY smolt releases.

Stillaguamish

The 2005 forecast for Stillaguamish River natural coho ocean recruits is 56,700, and 200 from a small tribal hatchery enhancement program. The natural coho forecast is based upon an adult/recruit spawner production model, which contains a recruitment rate adjustment variable based on the deviation pattern in Wallace River

Hatchery and S. F. Skykomish River natural coho recruits/smolt rate rates. The hatchery forecast is based on the 1998-2000 BY average Wallace River Hatchery CWT based recruits/smolt rate (8.0%).

Snohomish

The 2005 forecast for Snohomish River natural coho ocean recruits is 241,600. The Snohomish regional hatchery coho forecast is 59,100; 12,360 for the Wallace River Hatchery facility, 40,350 for the Tulalip Bay facility, 4,000 for the Possession Baithouse Net Pen located on southeast Whidbey Island, and 2,400 for the Skykomish River CoOp program. The natural coho forecast is based upon an adult/recruit spawner production model, which contains a recruitment rate adjustment variable based on the deviation pattern in Wallace River Hatchery and South Fork Skykomish River natural coho recruits/smolt rate rates. The forecast for the hatchery releases in this region is based on the 1998-2000 BY average Wallace River Hatchery CWT based recruits/smolt rate (8.0%).

South Sound

The 2005 forecasts for South Sound region natural and hatchery coho ocean recruits are 45,703 and 222,207, respectively. The natural coho forecast is the product of projected smolt production from each of the stream basins in the region multiplied by marine survival rate expectations ranging from 12.0% in central Puget Sound, to 3.0% - 5.0% in the deep South Sound region. The natural coho marine survival rate predictions are based upon review of the Big Beef Creek and Deschutes River indicator stocks, and review of hatchery and natural fish survival rate and/or adult run size information, which shows a consistent gradient of declining marine survival rates for coho originating from the southern vs. central Puget Sound regions. The hatchery coho forecasts are based on the 1998-2000 BY average CWT based recruits/smolt rate for each facility (1.8%-7.6%), applied to the 2002 BY smolt releases. Recent year survival rates have been highest for central Puget Sound hatchery facilities, and lower in southern Puget Sound.

Hood Canal

The 2005 forecasts for Hood Canal region natural and hatchery coho ocean recruits are 98,400 and 60,600, respectively. The natural coho forecast is based on an average of two different regressions of Big Beef Creek jacks versus Hood Canal December age-2 natural coho run sizes. The hatchery coho forecasts are based on the 1998-2000 BY average cohort reconstruction-based recruits/smolt rates for each facility (0.9%-5.6%), applied to the 2002 BY smolt releases.

SELECTIVE FISHERY CONSIDERATIONS

As the region has moved forward with mass marking of hatchery coho salmon stocks, selective fishing options have become an important consideration for fishery managers. Table III-5 summarizes estimates of mass mark rates for coho stocks from Southern British Columbia, Canada to the Oregon Coast, based on preseason abundance forecasts. Agencies have released coho mass marked with adipose clips from the 2002 brood, making these fish available to 2005 fisheries (Table III-6).

EVALUATION OF 2004 REGULATIONS ON 2005 STOCK ABUNDANCE

Escapements and fishery impacts were estimated using coho FRAM. Abundance forecasts for 2005 were updated for Washington and Oregon stocks, but forecasts for Canadian stocks are unchanged from those employed for 2004 planning. Updated forecasts for Canadian stocks are expected to become available in March 2005. To provide information on the effect of changes in abundance forecasts, the final 2004 pre-season regulatory package for ocean and inside fisheries was applied to 2005 projections of abundance.

Oregon Production Index Area

Ocean fisheries were modeled with 2004 Council regulations and 2004 expectations for non-Council area fisheries. Under this scenario, expected exploitation rates are 21.9% on OCN coho and 10.1% on Rogue/Klamath hatchery coho. Expected spawner escapement is 119,800 for OCN coho (Tables III-7 and III-8).

Based on parent escapement levels and observed OPI smolt-to-jack survival for 2002 brood OPI smolts, the total allowable OCN coho exploitation rate for 2005 fisheries is no greater than 20% under Amendment 13 and no greater than 15% under the matrix developed by the OCN work group. (Table III-9; Appendix A, Tables A-2 and A-3.) The total allowable Rogue/Klamath hatchery coho marine exploitation rate is 13% (NMFS ESA consultation standard). An additional consideration is impact to Oregon State-ESA listed lower Columbia natural coho. The total allowable lower Columbia River natural coho marine exploitation rate for 2005 fisheries is 15% under the Oregon State management plan.

Predicted ocean escapements into the Columbia River in 2005 under this exercise show that under 2004 ocean regulations, marked Columbia River late coho would not meet inside harvest or hatchery egg take goals.

North of the Oregon Production Index Area

Ocean escapement expectations in relation to management goals for selected naturally-spawning coho stocks, given 2005 preseason abundance forecasts and 2004 preseason projections for fishing patterns, are presented in Table III-7. More detailed fishery management goals for Council area coho stocks are listed in Appendix A, Table A-1.

Under 2004 regulations, ocean escapements for natural coho stocks north of the OPI index area are expected to be at levels that would permit attainment of FMP escapement goals for all U.S. stocks. Skagit and OCN appear to be the most limiting U.S. natural coho stocks. The exploitation rate by U.S. fisheries south of the Canadian border on Interior Fraser coho is projected to be 12%, exceeding the anticipated 10% allowable exploitation rate under the 2002 PST Coho Agreement.

Inside fisheries are anticipated to have greater impacts on Puget Sound and Interior Fraser River coho than 2004 because of the availability of pink salmon. Additionally, coho bycatch during Puget Sound fisheries directed at chum salmon will also be a consideration for preseason planning.

TABLE III-5. **Mass marking** of 2002 brood **coho** available to 2005 Council fisheries. The mark used is an adipose fin clip. (Page 1 of 1)

Region	Ocean Recruits (thousands of fish) Wild	Hatchery	Percent Mass Marked
PUGET SOUND STOCKS:			
Nooksack-Samish and 7/7A Independent	17,000	89,459	80.8%
Skagit	61,811	9,120	11.0%
Stillaguamish	56,700	200	0.0%
Snohomish	241,600	59,100	8.6%
South Puget Sound Normal	45,703	212,691	63.9%
South Puget Sound Delayed	0	9,516	99.6%
Hood Canal	99,620	59,302	30.4%
Strait of Juan de Fuca and Area 9	22,697	24,540	36.7%
Puget Sound Total	545,131	463,928	35.7%
WASHINGTON COASTAL STOCKS:			
North Coast Independent Tributaries	8,480	5,648	78.0%
Quillayute Summer	816	6,100	88.2%
Quillayute Fall	18,555	22,132	47.9%
Hoh	7,611	0	0.0%
Queets	17,123	19,781	15.7%
Quinault	44,912	33,560	34.4%
Grays Harbor	91,062	54,354	35.6%
Willapa Bay	35,891	56,427	58.2%
Washington Coastal Total	224,450	198,002	39.8%
COLUMBIA RIVER STOCKS:			
Columbia River Early		284,600	72.0%
Columbia River Late	-	78,000	84.0%
Columbia River Total	-	362,600	74.6%
OREGON COASTAL	28,300	152,000	9.0%
SOUTHERN BRITISH COLUMBIA STOCKS:[a/]			
Georgia Strait Mainland	129,295	17,538	5.6%
Georgia Strait Vancouver Island	194,247	12,763	3.3%
Johnstone Strait	90,685	28,172	6.6%
Southwest Vancouver Island	34,011	40,008	30.3%
Northwest Vancouver Island	40,867	12,518	3.3%
Lower Fraser River	5,601	73,362	69.7%
Interior Fraser River	34,360	1,708	0.2%
Southern British Columbia Total	529,066	186,069	38.0%

a/ For this assessment, the percent mass marked was assumed to be the same as in 2004.

TABLE III-6. Projected **coho mark rates** for 2005 fisheries under base period fishing patterns (% marked). (Page 1 of 1)

Area	Fishery	June	July	August	Sept
Canada					
Johnstone Strait	Recreational	-	10%	10%	-
West Coast Vancouver Island	Recreational	32%	22%	20%	15%
North Georgia Strait	Recreational	18%	18%	18%	15%
South Georgia Strait	Recreational	22%	21%	15%	14%
Juan de Fuca Strait	Recreational	29%	27%	30%	31%
Johnstone Strait	Troll	28%	17%	11%	14%
NW Vancouver Island	Troll	25%	22%	25%	25%
SW Vancouver Island	Troll	33%	32%	34%	35%
Georgia Strait	Troll	29%	29%	30%	22%
Puget Sound					
Strait of Juan de Fuca (Area 5)	Recreational	36%	33%	34%	33%
Strait of Juan de Fuca (Area 6)	Recreational	34%	31%	35%	31%
Strait of Juan de Fuca (Area 7)	Recreational	27%	33%	33%	25%
North Puget Sound (Areas 6 & 7A)	Net	-	23%	25%	32%
Council Area					
Neah Bay (Area 4/4B)	Recreational	39%	36%	39%	41%
LaPush (Area 3)	Recreational	41%	38%	47%	26%
Westport (Area 2)	Recreational	51%	50%	54%	57%
Columbia River (Area 1)	Recreational	70%	66%	65%	69%
Tillamook	Recreational	58%	53%	49%	39%
Newport	Recreational	54%	53%	48%	37%
Coos Bay	Recreational	47%	47%	37%	22%
Brookings	Recreational	45%	34%	31%	15%
Neah Bay (Area 4/4B)	Troll	28%	39%	36%	43%
LaPush (Area 3)	Troll	37%	43%	42%	39%
Westport (Area 2)	Troll	34%	43%	52%	43%
Columbia River (Area 1)	Troll	50%	53%	57%	62%
Tillamook	Troll	52%	50%	53%	49%
Newport	Troll	51%	52%	48%	48%
Coos Bay	Troll	46%	46%	38%	31%
Brookings	Troll	38%	40%	42%	29%
Columbia River					
Buoy 10	Recreational	-	-	-	67%

TABLE III-7. Estimated **ocean escapements** for critical natural and Columbia River hatchery **coho** stocks (thousands of fish) based on preliminary 2005 preseason abundance forecasts and 2004 Council regulations.[a/] (Page 1 of 1)

Stock	Ocean Escapement Estimates Under 2004 Regulations[b/] 2005 Preseason Abundance	2004 Preseason Abundance	2005 Spawning Escapement Goal[c/]
Natural Coho Stocks			
Skagit	46.9	130.9	30.0[d/]
Stillaguamish	39.0	26.6	17.0[d/]
Snohomish	164.8	134.0	70.0[d/]
Hood Canal	77.2	79.7	21.5[d/]
Strait of Juan de Fuca	17.9	31.8	12.8[d/]
Quillayute Fall	14.3	17.7	6.3 - 15.8
Hoh	5.6	6.6	2.0 - 5.0
Queets[e/]	12.3	14.7	5.8 - 14.5
Grays Harbor	74.4	101.1	35.4
OCN	119.8 (21.9%)	129.5 (14.7%)	Exploitation Rate ≤15.0%
R/K	NA (10.1%)	NA (8.6%)	Exploitation Rate ≤13.0%
Hatchery Coho Stocks			
Columbia Early	70.0	157.0	18.6
Columbia Late	4.3	84.1	11.9

a/ Quota levels include harvest and hooking mortality estimates used in planning the Council's 2004 ocean fisheries and a coho catch for the Canadian troll fishery off the West Coast of Vancouver Island (WCVI).

b/ 2004 preseason regulations include the following coho quota fisheries: Treaty Indian troll - 75,000 non-selective; non-Indian troll - 67,500 selective; recreational north of Cape Falcon - 202,500 selective; recreational Cape Falcon to Humbug Mt. - 75,000 selective. Ocean escapement is generally the estimated number of coho escaping ocean fisheries and entering freshwater. For Puget Sound stocks, ocean escapement is the estimated number of coho entering Area 4B which are available for U.S. net fisheries in Puget Sound and spawning escapement after impacts associated with the Canadian and Puget Sound troll and recreational fisheries have been deducted. For the OCN coho stock, this value represents the estimated spawner escapement in SRS accounting. For Columbia River hatchery stocks, ocean escapement represents the number of coho after the Buoy 10 fishery.

c/ Spawning escapement goals are not directly comparable to ocean escapement because inside fishery harvest is not considered.

d/ Annual management goals will be determined by the state and tribal comanagers during the preseason planning process. These goals will be expressed in terms of total mortality exploitation rate constraints.

e/ Ocean escapement of 12,260 wild does not include 915 supplemental.

TABLE III-8. Comparison of Oregon coastal natural **(OCN)** and Rogue/Klamath **(RK) coho harvest** mortality and exploitation rates by fishery under Council-adopted 2004 regulations and preliminary 2005 preseason abundance estimates. (Page 1 of 1)

	Harvest Mortality and Exploitation Rate			
	OCN		RK	
Fishery	Number	Percentage	Number	Percentage
SOUTHEAST ALASKA	0	0.0%	0	0.0%
BRITISH COLUMBIA	391	0.3%	8	0.1%
PUGET SOUND/STRAITS	148	0.1%	0	0.0%
NORTH OF CAPE FALCON				
Recreational	6,200	4.0%	11	0.1%
Treaty Indian Troll	1,707	1.1%	0	0.0%
Non-Indian Troll	3,650	2.4%	4	0.0%
SOUTH OF CAPE FALCON				
Recreational:				
Cape Falcon to Humbug Mt.	9,607	6.3%	59	0.6%
Humbug Mt. to Horse Mt. (KMZ)	2,835	1.8%	542	4.5%
Fort Bragg	1,040	0.7%	192	1.6%
South of Pt. Arena	899	0.6%	119	1.0%
Troll:				
Cape Falcon to Humbug Mt.	2,417	1.6%	26	0.3%
Humbug Mt. to Horse Mt. (KMZ)	158	0.1%	31	0.2%
Fort Bragg	753	0.5%	109	0.9%
South of Pt. Arena	1,026	0.7%	83	0.7%
BUOY 10	1,262	0.8%	0	0.0%
ESTUARY/FRESHWATER	1,435	0.9%	23	0.2%
TOTAL	33,528	21.9%	1,207	10.1%

TABLE III-9. Maximum **allowable** fishery **impact** rate for **OCN coho** under Amendment 13 matrix (Appendix A, Table A-2) and the OCN work group matrix (Appendix A, Table A-3) based on parent escapement levels by stock component and marine survival category.[a/] (Page 1 of 1)

	Estimated OCN Coho Spawners by Stock Component					Hatchery	Amendment 13 Matrix			OCN Work Group Matrix[b/]		
Fishery Year (t)	Parent Spawner Year (t-3)	Northern	North-Central	South-Central	Southern	Jack Survival Rate (t-1)	Marine Survival Category	Parental Spawner Category	Maximum Allowable Impacts	Marine Survival Category	Parental Spawner Category	Maximum Allowable Impacts
1998	1995	3,800	13,600	35,000	3,800	0.04%	Low	Very Low	≤10-13%	Extremely Low	Very Low	≤8%
1999	1996	3,300	18,100	51,500	4,600	0.10%	Med	Very Low	≤15%	Low	Critical	0-8%
2000	1997	2,100	2,800	17,700	8,300	0.12%	Med	Very Low	≤15%	Low	Critical	0-8%
2001	1998	2,600	3,300	25,200	2,300	0.27%	Med	Very Low	≤15%	Medium	Critical	0-8%
2002	1999	8,800	11,400	27,100	1,400	0.09%	Med	Low	≤15%	Low	Low	≤15%
2003	2000	17,900	14,300	34,700	11,000	0.20%	Med	Low	≤15%	Med	Low	≤15%
2004	2001	33,400	25,200	109,000	12,200	0.15%	Med	Low	≤15%	Med	Low	≤15%
2005	2002	50,200	102,700	101,000	7,800	0.11%	Med	High	≤20%	Low	High	≤15%
2006	2003	56,800	65,600	96,200	6,800	-	-	Low	-	-	Low	-
2007	2004	59,700	36,900	93,200	24,500	-	-	Med	-	-	Med	-

a/ Under the NMFS ESA consultation standards, the southern stock component is managed for a total allowable Marine Exploitation rate of 13%, as represented by Rogue/Klamath hatchery stocks, which is separate from these OCN coho impact rates.

b/ Developed by the OCN workgroup as a result of the 2000 Review of Amendment 13.

CHAPTER IV
FRASER RIVER AND PUGET SOUND PINK SALMON ASSESSMENTS

Two major stocks comprise the pink salmon population available to Council ocean fisheries during odd-numbered years. Table IV-1 provides a summary of recent run sizes.

The more abundant of the two runs originates from the Fraser River in British Columbia, Canada. The 2005 forecast run size for Fraser pinks is16.3 million fish, 37% below the 2003 forecast of 26 million fish. The 2005 Puget Sound pink salmon forecast is 1.97 million natural and 9,600 hatchery fish.

Fraser River and Puget Sound pinks occur in significant numbers only in odd-numbered years. The only self-sustaining even-year run known to occur in Washington is from the Snohomish River. This run has been steadily increasing over the 20 years that it has been monitored.

TABLE IV-1. Estimated annual **run sizes** (odd-numbered years 1977-2005) for Fraser River and Puget Sound **pink salmon** in millions.

Year	Puget Sound[a/]	Fraser River[b/]
1977	0.88	8.21
1979	1.32	14.40
1981	0.50	18.69
1983	1.01	15.35
1985	1.76	19.10
1987	1.57	7.17
1989	1.93	16.63
1991	1.09	22.33
1993	1.06	17.01
1995	2.11	12.88
1997	0.44	8.20
1999	0.95	3.59
2001[c/]	3.50	21.19
2003[c/]	2.30	26.00
2005[c/]	1.97	16.30

APPENDIX A
SUMMARY OF COUNCIL STOCK MANAGEMENT GOALS

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TABLE A-2. Allowable fishery impact rate criteria for OCN coho stock components under the Salmon Fishery Management Plan Amendment 13 72

TABLE A-3. Fishery impact rate criteria for OCN coho stock components based on the harvest matrix resulting from the OCN work group 2000 review of Amendment 13 73

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 1 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - CHINOOK - - -		
CALIFORNIA CENTRAL VALLEY - All fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin Rivers and their tributaries. Management of this stock complex is based primarily on Sacramento River fall chinook, which includes a large hatchery component and natural Sacramento River winter chinook, which are listed as endangered. The San Joaquin system has been severely degraded by water development projects and pollution. Natural populations of spring chinook there have been extirpated, and remaining spawning areas are utilized primarily by fall chinook, which have comprised <10% of the total Central Valley fall run.			
Sacramento River Fall	122,000-180,000 natural and hatchery adult spawners (MSY proxy adopted 1984). This objective is intended to provide adequate escapement of natural and hatchery production for Sacramento and San Joaquin fall and late-fall stocks based on habitat conditions and average run-sizes as follows: Sacramento River 1953-1960; San Joaquin River 1972-1977 (ASETF 1979; PFMC 1984; SRFCRT 1994). The objective is less than the estimated basin capacity of 240,000 spawners (Hallock 1977), but greater than the 118,000 spawners for maximum production estimated on a basin by basin basis before Oroville and Nimbus Dams (Reisenbichler 1986).	Yes.	Contributes to ocean fisheries off California, southern and central Oregon, Washington, and British Columbia. Council management actions on this stock are directed at fisheries south of Pt. Arena; impacts on this stock between Pt. Arena and Horse Mt. are incidental to management measures directed at Klamath River fall chinook.
Sacramento River Spring Threatened (1999)	Listed as threatened under ESA. NMFS ESA consultation standard/recovery plan. Present level of ocean fishery impacts limited by measures constraining harvest on Sacramento River winter and Klamath River fall chinook.	Indirectly. MSY criteria undefined. Assessment of ocean distribution and fishery impacts needed for ESA determination and to aid management.	Contributes to ocean fisheries off California, but also known to occur off Oregon. Ocean fishery impacts primarily incidental to harvest of Sacramento River fall chinook and may be lower due to differences in run timing. Stock has been affected by man-caused loss and deterioration of freshwater habitat.
Sacramento River Winter Endangered (1994)	Listed as endangered under ESA. NMFS ESA consultation standard requires duration and timing of commercial and recreational fisheries south of Pt. Arena not to change substantially relative to 2000 and 2001. A new biological opinion will be completed prior to May 1, 2004.	No. NMFS ESA consultation standard provides interim rebuilding program.	Believed to contribute predominantly to ocean fisheries south of Pt. Arena. Ocean fishery impacts incidental to harvest of Sacramento River fall chinook.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 2 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - CHINOOK - - -		
NORTHERN CALIFORNIA COAST - All fall and spring stocks of California streams north of the entrance to San Francisco Bay. Management of this stock complex is based primarily on meeting spawning escapements for natural fall chinook. Limited data is available except for the Klamath River. An assessment and monitoring program is under consideration by CDFG for stocks originating from the Smith, Eel, Mattole, and Mad Rivers, which might provide a more thorough management basis for the future. There are significant water diversion problems in several drainages. In the Klamath River Basin, there is significant hatchery production of fall chinook, and less so of spring chinook, resulting primarily from mitigation programs for dams constructed in both Upper Klamath and Trinity Rivers.			
Eel, Mattole, Mad, and Smith Rivers (Fall and Spring) Eel, Mattole, and Mad River stocks - Threatened (1999)	Eel, Mattole, and Mad River stocks listed as threatened under ESA. Data insufficient to define MSY criteria. Indices of spawning abundance limited to one tributary of the Mad River and two tributaries of the Eel River. NMFS ESA consultation standard/recovery plan for Eel, Mattole, and Mad River stocks requires that the projected ocean harvest rates on age-4 Klamath River fall chinook not exceed 16%.	Indirectly. Data insufficient to define MSY criteria. CDFG developing an assessment and monitoring program.	Very limited management data available. Believed to occur in ocean fisheries off northern California and southern Oregon. Ocean fishery impacts incidental to fisheries for Sacramento and Klamath Rivers fall chinook. No preseason or postseason abundance estimates available.
Klamath River Fall (Klamath and Trinity Rivers)	33% to 34% of potential adult natural spawners, but no fewer than 35,000 naturally spawning adults in any one year. Brood escapement rate must average 33% to 34% over the long-term, but an individual brood may vary from this range to achieve the required tribal/nontribal annual allocation. Objective designed to allow a wide range of spawner escapements from which to develop an MSY objective or proxy while protecting the stock during prolonged periods of reduced productivity. Adopted 1988 based on Hubbell and Boydstun (1985); KRTT (1986); PFMC (1988); minor technical modifications in 1989 and 1996 (Table I-1). Natural spawners to maximize recruitment are estimated at 41,000 to 106,000 adults (Hubbell and Boydstun 1985).	Yes. A conservation alert or overfishing concern will be based on a failure to meet the 35,000 floor.	Contributes primarily to ocean fisheries from Humbug Mt., Oregon to Horse Mt., California (the KMZ) and to Klamath River tribal and recreational fisheries. Coastwide impacts are considered in meeting allocation requirements for Indian tribes with federally recognized fishing rights and the inland fishery. Specific management measures for this stock generally are implemented from Pigeon Pt., California to Florence, Oregon.
Klamath River Spring (Klamath and Trinity Rivers)	Undefined. Productive potential believed to be protected by fishery management objective for Klamath River fall chinook, which includes an inside allocation to tribal and sport fisheries.	Indirectly. MSY criteria undefined.	Little information available on ocean distribution. Believed to occur in ocean fisheries off northern California and southern Oregon (based on Trinity River Hatchery fish).

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 3 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
OREGON COAST - All fall and spring stocks from Oregon streams south of the Columbia River. No preseason abundance estimates available. Management based primarily on an aggregate objective of 150,000 to 200,000 natural adult spawners (attainment of objective based on a postseason estimate of 60 to 90 natural adult spawners per mile in nine standard index streams). This objective is based on optimal escapement estimates for individual coastal rivers at habitat capacity (Thompson 1977). Lower end of the objective range is nearly twice the estimated MSY spawning escapement of 79,000 fall chinook adults based on stock recruit analysis (McGie 1982). Significant hatchery production also exists within the coastal streams. Far-north migrating, naturally spawning stocks are also subject to the 1999 chinook agreement of the Pacific Salmon Commission and may be subject to exploitation rate constraints in U.S. fisheries south of the Canada/Washington border.			
Southern Oregon (Aggregate of fall and spring stocks in all streams south of Elk River; Rogue River fall stock is used to indicate relative abundance and ocean contribution rates)	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	Yes, based on postseason estimates of <60 natural adult spawners per mile. Conservation also ensured by the objective for Klamath River fall chinook, which includes a large inside allocation component that reduces ocean fishery exploitation rate in areas inhabited by these fish.	Medium abundance. Data limited except for Rogue River fall stock. Stocks migrate southerly or remain local, and fall chinook contribute to ocean fisheries off northern California and Oregon, less so for spring stocks.
Central and Northern Oregon (Aggregate of fall and spring stocks in all streams from the Elk River to just south of the Columbia River)	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	Yes, based on postseason estimates of <60 natural adult spawners per mile.	Variable between high and medium abundance. Stocks migrate northward and contribute to ocean fisheries off British Columbia and southeast Alaska, and to a lesser degree, off Washington and Oregon. Nehalem, Siletz, and Siuslaw stocks are subject to the PSC ISBM harvest limitations.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 4 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - CHINOOK - - -		
COLUMBIA RIVER BASIN - All pertinent fall, summer, and spring stocks of the Columbia River and its tributaries. Stocks within this complex are noted by area of origin: lower river (below Bonneville Dam), mid-river (Bonneville to McNary Dams), and upper river (above McNary Dam). Spawner escapement goals for these stocks are set through procedures of the U.S. District Court in U.S. v. Oregon and subsequent court orders. These goals are set forth in the Columbia River Fishery Management Plan and are recognized in the Council's conservation objectives. Annual inside fishery management planning activities are conducted within the Columbia River Compact and other state and tribal management forums. The Columbia River Compact, initially established by Oregon and Washington to jointly administer commercial fisheries within the Columbia River, takes into account the impacts from other state and tribal fisheries (e.g., recreational, ceremonial, subsistence, etc.) authorized under the Columbia River Fish Management Plan. The majority of ocean chinook harvest north of Cape Falcon is provided by Columbia River salmon stocks, primarily hatchery production of tule fall chinook from the Bonneville Pool (Spring Creek) and lower river hatcheries, smaller numbers of upper river bright hatchery and natural fall chinook, and some lower river hatchery spring chinook (Cowlitz). Hatchery objectives are based on long-range production programs and/or mitigation requirements associated with displaced natural stocks. Threatened Snake River fall chinook, which suffer from severe dam passage mortalities and extreme loss of freshwater habitat, are of prime concern in limiting ocean exploitation rates in all ocean fisheries north of Pigeon Pt., California. These limits act to provide considerable protection to other weak natural stocks subject to ocean fishery impacts. Naturally spawning stocks are also subject to the 1999 chinook agreement of the Pacific Salmon Commission and may be subject to exploitation rate constraints in U.S. fisheries south of the Canada/Washington border.			
North Lewis River Fall Threatened (1999)	NMFS ESA consultation standard/recovery plan (not established at time of printing). McIsaac (1990) stock-recruit analysis supports MSY objective of 5,700 natural adult spawners.	No. Listed stock. NMFS ESA consultation standard provides interim rebuilding program. Base period Council-area ocean fishery impacts around 7%.	Medium abundance. Present in ocean fisheries north of Cape Falcon to SE Alaska. Subject to the PSC ISBM harvest limitations.
Lower River Hatchery Fall	15,400 adults to meet egg-take goal or as determined by management entities.	No (hatchery exception).	Medium abundance. Major contributor to ocean fisheries north of Cape Falcon to central British Columbia.
Lower River Hatchery (Spring)	2,700 adults to meet Cowlitz, Kalama, and Lewis Rivers broodstock needs.	No (hatchery exception).	Medium to low abundance. Present in ocean fisheries north of Cape Falcon to southeast Alaska.
Upper Willamette (Spring) Threatened (1999)	NMFS ESA consultation standard/recovery plan (ODFW FMEP). Willamette River Management Plan provides an MSY proxy of 30,000 to 45,000 hatchery and natural adults over Willamette River falls, depending on run size.	No. Listed stock. NMFS ESA consultation standard provides interim rebuilding program. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding.	Present in fisheries north of Cape Falcon to southeast Alaska.
Mid-Columbia Bright Hatchery (Fall)	None for ocean fishery management.	No (hatchery exception).	High abundance. Contributor to ocean fisheries off Washington, British Columbia, and southeast Alaska. Primarily produced at Bonneville Hatchery.
Spring Creek Hatchery (Fall)	7,000 adults to meet hatchery egg-take goal.	No (hatchery exception).	Medium to high abundance. Significant contributor to ocean fisheries north of Cape Falcon to southern British Columbia.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 5 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
COLUMBIA RIVER BASIN (continued)			
Klickitat, Deschutes, John Day, and Yakima Rivers (Spring)	Hold ocean fishery impacts at or below base period (<1%) and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state and tribal management entities considering separate conservation objectives for these stocks).	Limited. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding. Major habitat restoration addressing water withdrawals and dam passage and blockages is necessary for rebuilding.	Medium abundance. No significance to ocean fisheries, infrequent occurrence in fisheries north of Cape Falcon to Alaska.
Snake River Fall Threatened (1992)	NMFS ESA consultation/recovery standard. Since 1995, Council has met a standard of limiting its fisheries so that the total exploitation rate on age-3 and age-4 Lyons Ferry Hatchery fall chinook (representing Snake River fall chinook) for all ocean fisheries (including Canada) has been ≤70% of the 1988-1993 average adult equivalent exploitation rate. Prior to listing, managed within objectives for upper Columbia River bright fall chinook. Guidance for 2004 will be provided prior to the March Council meeting.	No. Listed stock, MSY criteria undefined. NMFS ESA consultation standard provides interim rebuilding program. Recovering historic abundance unlikely, as dams block former primary spawning area.	Present in ocean fisheries from central California to southeast Alaska with greatest contribution to Canadian fisheries. Primary impacts in Council fisheries north of Cape Falcon, but also extending to Pigeon Pt., California.
Snake River Spring/Summer Threatened (1992)	Not applicable for ocean fisheries.	No. Listed stock. Base period Council-area ocean fishery impacts rare (unmeasurable). Dam passage mortality must be reduced to allow stock recovery.	Depressed, recent upward trend. Rare occurrence in ocean fisheries from Washington to southeast Alaska.
Upper River Bright (Fall)	40,000 natural bright adults above McNary Dam (MSY proxy) adopted in 1984 based on CRFMP. The management goal was increased to 45,000 by Columbia River managers between 1986 and 1993. Since 1994, inriver fisheries management was based on a NMFS ESA consultation standard exploitation rate to protect snake River wild fall chinook.	Limited. Base period Council-area ocean fishery exploitation rate <4% prevents effective Council fishery management and rebuilding.	High abundance. Significant contributor to ocean fisheries off Canada, and to a lesser extent, Washington and Oregon. Primary impact area north of Cape Falcon. Subject to the PSC ISBM harvest limitations.
Upper River Summer	Hold ocean fishery impacts at or below base period (<2%); recognize CRFMP objective - MSY proxy of 80,000 to 90,000 adults above Bonneville Dam, including both Columbia and Snake River stocks (state and tribal management entities considering separate objectives for these stocks).	Limited. Base period Council-area ocean fishery exploitation rate <2% prevents effective Council fishery management and rebuilding. Dam passage mortalities must be reduced to allow rebuilding.	Long-term depressed abundance, significant upward trend in the last few years. Present in ocean fisheries north of Cape Falcon to southeast Alaska. Subject to the PSC ISBM harvest limitations.
Upper Columbia River Spring Endangered (1999)	None applicable to ocean fisheries. Ensure ocean fishery impacts remain rare and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state/tribal management entities considering separate objectives for these stocks).	No. Listed stock. Base period Council-area ocean fishery impacts rare (not measurable), making Council management and rebuilding ineffective. Reduce dam passage mortalities to allow rebuilding.	Long-term depressed abundance, recent upward trend. Captive broodstock programs started in 1997. No significance to ocean fisheries. Rare occurrence in ocean fisheries north of Cape Falcon to Canada.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 6 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - CHINOOK - - -		
WASHINGTON COAST - All pertinent fall, summer and spring stocks from coastal streams north of the Columbia River through the western Strait of Juan de Fuca (west of the Elwha River). This stock complex consists of several natural stocks, generally of small to medium sized populations, and some hatchery production (Willapa Bay and the Quinault River). Stocks in this complex tend to range further north than most Columbia River stocks and, while present in fisheries from Cape Falcon to southeast Alaska, are not significantly impacted by Council-area ocean fisheries. Preseason abundance estimates are generally not available for Council management. These stocks qualify as exceptions to the Council's overfishing criteria, due to very low fishery impacts. Spawning escapement goals for stocks managed within this complex, established in U.S. District Court by WDFW and the treaty tribes, are recognized in the Council's conservation objectives below. Objectives for Grays Harbor and the north coast river systems have been established pursuant to the U.S. District Court order in Hoh v. Baldrige. However, annual natural spawning escapement targets may vary from the conservation objectives below if agreed to by WDFW and the treaty tribes under the provisions of Hoh v. Baldrige and subsequent U.S. District Court orders. After agreement is reached on the annual targets, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for treaty allocation and inside, non-Indian fishery needs. Naturally spawning stocks are also subject to the 1999 chinook agreement of the Pacific Salmon Commission and may be subject to exploitation rate constraints in U.S. fisheries south of the Canada/Washington border.			
Willapa Bay Fall (Natural)	Undetermined.	Limited (exploitation rate exception).	
Willapa Bay Fall (Hatchery)	8,200 adult return to hatchery.	No (hatchery exception).	
Grays Harbor Fall	14,600 natural adult spawners--MSP based on full seeding of spawning and rearing habitat (WDF 1979).	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Grays Harbor Spring	1,400 natural adult spawners.	Limited (exploitation rate exception).	
Quinault Fall	Hatchery production.	No (hatchery exception).	
Queets Fall	Manage terminal fisheries for 40% harvest rate, but no less than 2,500 natural adult spawners, the MSY level estimated by Cooney (1984).	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Queets Spring/Summer	Manage terminal fisheries for 30% harvest rate, but no less than 700 natural adult spawners.	Limited (exploitation rate exception).	
Hoh Fall	Manage terminal fisheries for 40% harvest rate, but no less than 1,200 natural adult spawners, the MSY level estimated by Cooney (1984).	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Hoh Spring/Summer	Manage terminal fisheries for 31% harvest rate, but no less than 900 natural adult spawners.	Limited (exploitation rate exception).	
Quillayute Fall	Manage terminal fisheries for 40% harvest rate, but no less than 3,000 natural adult spawners, the MSY level estimated by Cooney (1984).	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Quillayute Spring/Summer	1,200 natural adult spawners for summer component (MSY).	Limited (exploitation rate exception).	
Hoko Summer/Fall (Western Strait of Juan de Fuca)	850 natural adult spawners, the MSP level estimated by Ames and Phinney (1977). May include adults used for supplementation program.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 7 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - CHINOOK - - -		
PUGET SOUND - All fall, summer, and spring stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). This stock complex consists of numerous natural chinook stocks of small to medium sized populations and significant hatchery production. Puget Sound stocks contribute to fisheries off British Columbia and are present into southeast Alaska, but are impacted to a minor degree by Council-area ocean fisheries. Base period, Council-area ocean fishery exploitation rates (adult equivalent) of 2% or less are below a management threshold which allows effective Council management of these stocks and they qualify as **exceptions** to the Council's overfishing criteria. The naturally spawning stocks within this complex are listed as threatened under the ESA. Naturally spawning stocks are also subject to the 1999 chinook agreement of the Pacific Salmon Commission and may be subject to exploitation rate constraints in U.S. fisheries south of the Canada/Washington border. Management objectives for hatchery stocks are based on hatchery escapement needs. Fisheries in Puget Sound conducted under a Resource Management Plan (RMP) are exempted from ESA Section 9 take prohibitions under Limit 6 of the 4(d) rule. This RMP will expire on May 1 of this year. A new RMP is currently under review by NOAA Fisheries but this review will not be completed prior to the March Council meeting.			
Eastern Strait of Juan de Fuca Summer/Fall Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	
Skokomish Summer/Fall (Hood Canal) Threatened (1999)	NMFS ESA consultation standard. Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	
Nooksack Spring (early) Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Skagit Summer/Fall Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Skagit Spring Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Stillaguamish Summer/Fall Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Snohomish Summer/Fall Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
Cedar River Summer/Fall (Lake Washington) Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER). The preliminary 2004 consultation standard is an RER constraint total mortality in all fisheries not to exceed 31%.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.
White River Spring Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER).Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	
Puyallup Summer/Fall Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER).Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	
Green River Summer/Fall Threatened (1999)	NMFS ESA consultation standard. Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	Subject to the PSC ISBM harvest limitations.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 8 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
PUGET SOUND (continued)			
Nisqually River Summer/Fall (South Puget Sound) Threatened (1999)	NMFS ESA consultation standard. Guidance will be provided prior to the March Council meeting.	Limited (exploitation rate exception).	
Mid Hood Canal Fall Threatened (1999)	NMFS ESA consultation standard is expressed in terms of Recovery Exploitation Rate (RER).Guidance will be provided prior to the March Council meeting..	Limited (exploitation rate exception).	
SOUTHERN BRITISH COLUMBIA - Fall and spring stocks of British Columbia coastal streams and the Fraser River. Management based primarily on natural and hatchery fall chinook. Base period, Council-area ocean fishery exploitation rates (adult equivalent) on the coastal stocks of 1% or less are below a management threshold which allows effective Council management of these stocks, and they qualify as **exceptions** to the Council's overfishing criteria.			
Coastal Stocks	Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.	No. Under Canadian authority and would also be an exploitation rate exception.	Medium abundance. Major contributors to ocean fisheries off British Columbia; significant contributors north into southeast Alaska and present off northern Washington.
Fraser River	Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.	No. Under Canadian authority.	Medium abundance. Major contributors to ocean fisheries off British Columbia; contributors off northern Washington; and present north into southeast Alaska. Harrison River stock subject to the PSC ISBM harvest limitations.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 9 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
OREGON PRODUCTION INDEX AREA - All Washington, Oregon, and California natural and hatchery coho stocks from streams south of Leadbetter Pt. Significant production from Columbia River and Oregon coastal hatcheries provide harvest in ocean fisheries throughout the Council management area. Ocean fisheries are usually limited primarily to meet natural escapement objectives. Treaty Indian obligations, non-Indian harvest opportunity, and hatchery requirements must also be factored in for the Columbia River stocks. Natural components have been severely depressed for several yeas due to a combination of previously high fishery impacts, major losses or degradation of freshwater habitat, and long-term marine conditions unfavorable to coho survival.			
Central California Coast Threatened (1996)	NMFS ESA consultation standard/recovery plan. Since 1998, no retention of coho in commercial and recreational fisheries off California in conjunction with total marine fishery impacts of no more than 13% on Rogue/Klamath hatchery coho (surrogate stock). Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. NMFS ESA consultation standard provides interim protection of productive capacity. Recovery limited by deterioration of significant portions of freshwater habitat, distribution at southern edge of coho range, and ongoing unfavorable marine conditions.	Very minor component of OPI area fisheries, limited potential for significant contribution to ocean and inland fisheries. Current impacts incidental in ocean fisheries off California. Development of monitoring and assessment program considered for Ten Mile River, Noyo River, Gualala River, Lagunitas Creek, and Scott Creek. Rogue/Klamath coho are believed to have a similar, but more northerly distribution.
Northern California Threatened (1997)	NMFS ESA consultation standard/recovery plan. Since 1998, total marine fishery impacts limited to no more than 13% on Rogue/Klamath hatchery coho (surrogate stock) and no retention of coho in California ocean fisheries. Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. NMFS ESA consultation standard provides interim protection of productive capacity. Recovery may last more than 10 years even with no fishery impacts, due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.	Depressed and listed. Very minor natural component of OPI area fisheries, potential for minor contribution to ocean fisheries off California and southern Oregon, and inland California fisheries. Current impacts incidental in ocean and inland fisheries (total non-retention south of Cape Falcon since 1994). CDFG considering monitoring to provide data for the Smith, Trinity, Eel, Mattole, and Klamath Rivers.
Oregon Coastal Natural Comprised of Southern, South-Central, North-Central, and Northern Oregon stocks. Threatened (1997 and 1998)	NMFS ESA consultation standard/recovery plan consistent with Council's objective under Amendment 13 and the Oregon Plan: For each of the four component stocks, a rebuilding and data collection program with an allowable marine and freshwater exploitation rate of no more than 13% to 35%, depending on parent escapement and ocean survival trends (adopted 1997). For a detailed description of the objective, see Section 3.3.2. Prior Council objectives contained in PFMC (1984 and 1993).	No. Listed stock, rebuilding program initiated in 1998. The annual conservation objective should allow component stocks to rebuild when environmental conditions are favorable. Recovery for some components may last more than 10 years even with no fishery impacts, due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.	Recent increases in abundance. Major natural component of OPI area and freshwater fisheries in Oregon coastal streams. Current impacts are primarily incidental in ocean fisheries under a total nonretention regulation south of Cape Falcon since 1994.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 10 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
OREGON PRODUCTION INDEX (continued)			
Columbia River Late (Hatchery)	Hatchery rack return goal of 17,200 adults.	No (hatchery exception).	Major component of ocean fisheries north of Cape Falcon. When abundant, significant contributors to ocean fisheries off Oregon north into Canada and Columbia River fisheries.
Columbia River Early (Hatchery)	Hatchery rack return goal of 18,800 adults.	No (hatchery exception).	Major component of OPI area fisheries. When abundant, significant contributors to ocean fisheries off California and north to Leadbetter Pt., Washington and to Columbia River fisheries. Current ocean fishery impacts from very limited retention fisheries north of Cape Falcon and incidental hook-and-release mortality in fisheries south of Cape Falcon.
Columbia River (Natural)	Undefined. Management is in a transitional phase pending completion of a critical review that may establish an explicit objective.	Not presently. See management information.	Extinct above The Dalles Dam, very rare below. Lower river coho are a candidate species under the ESA and are listed under the Oregon State ESA.
WASHINGTON COASTAL - All pertinent natural and hatchery stocks originating in Washington coastal streams north of the Columbia River through the western Strait of Juan de Fuca (West of the Elwha River). Management goals for Grays Harbor and Olympic Peninsula coho stocks include achieving natural spawning escapement objectives and treaty allocation requirements, although Grays Harbor also contains a significant amount of hatchery production. The conservation objectives for these stocks are based on MSY spawner escapements established pursuant to the U.S. District Court order in Hoh v. Baldrige. Annual natural spawning escapement targets and total escapement objectives are established by the Washington Department of Fish and Wildlife and treaty tribes under the provisions of U.S. v. Washington and subsequent U.S. District Court orders. After agreement to annual targets is reached by the parties in this litigation, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for providing treaty allocation requirements and inside, non-Indian fishery needs. The conservation objectives for the Queets, Hoh, and Quillayute Rivers were developed as ranges intended to bracket the current best estimates of MSY escapement. The range of each objective reflects the degree of uncertainty inherent by using the high estimate of recruits-per-spawner and low estimate of carrying capacity for the lower bound and the low estimate of recruits-per-spawner with the high estimate of smolt carrying capacity for the upper end of the range. The ranges were subsequently adjusted upward for risk aversion and again for habitat considerations by 26% to 184% (Lestelle *et al.* 1984). These stocks are also subject to provisions of the 2002 PSC Coho Management Plan, which requires the United States and Canada to constrain total fishery exploitation rates to levels associated with the categorical status (low, moderate, and abundant) and target exploitation rates of the key management units as determined by domestic managers. Ceilings on exploitation rates by intercepting fisheries are established through formulas specified in the PSC Management Plan. However, the salmon FMP management objectives determine the criteria for triggering a conservation alert or an overfishing concern; annual management objectives established pursuant to U.S. District Court orders and the PSC Coho Management Plan do not.			
Willapa Bay (Hatchery)	Meet WDFW program objectives.	No (hatchery exception).	Contributes to ocean fisheries off northern Oregon north into Canada. Significant contributor to inside non-Indian commercial net and recreational fisheries. WDFW critically reviewing current management to determine if objectives for natural stocks are warranted.
Grays Harbor	35,400 natural adult spawners (MSP based on WDF [1979]) or annual target agreed to by WDFW and the Quinault Indian Nation .	Yes. Conservation alert or overfishing concern based on fewer than 35,400 natural spawners.	Ocean distribution from Oregon to northern British Columbia. Harvested by treaty Indian, non-Indian commercial, and recreational fisheries in Grays Harbor and tributary rivers.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 11 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
WASHINGTON COAST (continued)			
Queets	MSY range of 5,800 to 14,500 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and the Quinault Indian Nation.	Yes. Conservation alert or overfishing concern based on fewer than 5,800 natural spawners.	Ocean distribution from south-central Oregon to northwest Vancouver Island off British Columbia. Harvested by treaty Indian gillnet and non-treaty recreational fisheries inriver. Coho supplementation project conducted since the late 1970s.
Hoh	MSY range of 2,000 to 5,000 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and Hoh Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 2,000 natural spawners.	Ocean distribution from south-central Oregon to northwest Vancouver Island off British Columbia. Harvested by treaty Indian gillnet and non-treaty recreational fisheries inriver.
Quillayute Fall	MSY range of 6,300 to 15,800 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and the Quillayute Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 6,300 natural spawners.	Ocean distribution from south-central Oregon to northwest Vancouver Island off British Columbia. Harvested by treaty Indian gillnet and non-treaty recreational fisheries inriver.
Quillayute Summer (Hatchery)	Meet hatchery program objectives.	No (hatchery exception).	Early river entry timing. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Western Strait of Juan de Fuca (Sekiu, Hoko, Clallam, Pysht, East and West, and Lyre Rivers and miscellaneous streams west of the Elwha River)	40% (low status) exploitation rate.	Yes.	Little information on ocean distribution.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 12 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - -COHO- - -	
PUGET SOUND - All pertinent natural and hatchery stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). The Puget Sound Salmon Management Plan defines management objectives and long-term goals for these stocks as developed by representatives from federal, state, and tribal agencies. Conservation objectives for specific stocks are currently based on either MSP principles for stocks managed primarily for natural production or upon hatchery escapement needs for stocks managed for artificial production. Puget Sound management procedures are outlined in a "Memorandum Adopting Salmon Management Plan" (U.S. v. Washington, 626 F. Supp. 1405 [1985]). The original conservation objectives were developed by a State/Tribal Management Plan Development Team following the Boldt Decision with the goal for natural spawning stocks defined as "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The methodology used to develop the objectives was based on assessment of the quantity and quality of rearing habitat and the number of adult spawners required to fully seed the habitat (Zillges 1977). Some objectives have subsequently been modified in 1983 by the U.S. District Court Fisheries Advisory Board (Clark 1983 and PSSSRG 1997) and later determinations of the WDFW/Tribal Technical Committee. These natural stocks are also subject to provisions of the 2002 PSC Coho Management Plan, which requires the United States and Canada to constrain total fishery exploitation rates to levels associated with the categorical status (low, moderate, and abundant) and target exploitation rates of the key management units as determined by domestic managers. Ceilings on exploitation rates by intercepting fisheries are established through formulas specified in the PSC Management Plan. However, the salmon FMP management objectives determine the criteria for triggering a conservation alert or an overfishing concern; annual management objectives established pursuant to U.S. District Court orders and the PSC Coho Management Plan do not.			
Eastern Strait of Juan de Fuca (Streams east of Salt Creek through Chimacum Creek))	40% (low status) total exploitation rate.	Yes.	Little information on ocean distribution.
Hood Canal	45% (low status) total exploitation rate.	Yes.	Ocean distribution from Cape Falcon, Oregon to British Columbia.
Skagit	60% (normal status) total exploitation rate.	Yes.	Ocean distribution from Cape Falcon, Oregon to British Columbia.
Stillaguamish	50% (normal status) total exploitation rate.	Yes.	Ocean distribution from Cape Falcon, Oregon to British Columbia.
Snohomish	60% (normal status) total exploitation rate.	Yes.	Ocean distribution from Cape Falcon, Oregon to British Columbia.
South Puget Sound (Hatchery)	Hatchery rack return goal of 52,000 adults. Natural production goals under development.	No (hatchery exception).	Ocean distribution from Cape Falcon, Oregon to British Columbia.
SOUTHERN BRITISH COLUMBIA COAST - Stocks of southern British Columbia coastal streams (including Vancouver Island) and the Fraser River.			
Coastal Stocks	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.	No. Not under Council management authority.	Contributes to ocean fisheries off British Columbia, north into southeast Alaska and present off northern Washington.
Fraser River	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.	No. Not under Council management authority.	Contributes to ocean fisheries off British Columbia and Washington, and to Strait of Juan de Fuca and Puget Sound fisheries.

TABLE A-1. **Conservation objectives** and management information for salmon stocks of significance to ocean salmon fisheries. Abundance information is based on recent year information.[d/] (Page 13 of 13)

Stock	Conservation Objective (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
- - - PINK (odd-numbered years) - - -			
The Fraser River Panel of the PSC manages fisheries for pink salmon in the Fraser River Panel Area (U.S.) north of 48° N latitude to meet Fraser River natural spawning escapement and U.S./Canada allocation requirements. The Council manages pink salmon harvests in that portion of the EEZ, which is not in the Fraser River Panel Area (U.S.) waters consistent with Fraser River Panel management intent. Pink salmon management objectives must address meeting natural spawning escapement objectives, allowing ocean pink harvest within fixed constraints of coho and chinook harvest ceilings and providing for treaty allocation requirements.			
Puget Sound	900,000 natural spawners or consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel).	No. Minor impacts in Council fisheries and not under Council management authority.	Contributes to ocean fisheries off British Columbia and in Puget Sound. Present south into Oregon. Rare off California.
Fraser River	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel).	No. Minor impacts in Council fisheries and not under Council management authority.	Contributes to ocean fisheries off British Columbia; present into southeast Alaska and off Washington and northern Oregon. Rare off California.

a/ Total Puget Sound run size includes stocks other than Puget Sound pink stocks.
b/ Total run size.
c/ Preliminary; from preseason forecast.
d/ This table may be updated periodically by formal amendments to the FMP or comprehensive technical reviews, which result in modified conservation objectives or the development of rebuilding programs in response to overfishing concerns. In addition, any stock listed under the ESA and its ESA consultation standard or recovery plan will immediately be incorporated in the table.

TABLE A-2. **Allowable** fishery **impact** rate criteria for **OCN coho** stock components under the Salmon Fishery Management Plan **Amendment 13**. (Page 1 of 1)

PARENT SPAWNER STATUS		MARINE SURVIVAL INDEX (based on return of jacks per hatchery smolt) Low (<0.0009)	Medium (0.0009 to 0.0034)	High (>0.0034)
		Allowable Total Fishery Impact Rate		
High:	Parent spawners achieved Level #2 rebuilding criteria; grandparent spawners achieved Level #1	≤15%	≤30%[a/]	≤35%[a/]
Medium:	Parent spawners achieved Level #1 or greater rebuilding criteria	≤15%	≤20%[a/]	≤25%[a/]
Low:	Parent spawners less than Level #1 rebuilding criteria	≤15% ≤10-13%[b/]	≤15%	≤15%

Rebuilding Criteria	OCN Coho Spawners by Stock Component: Northern	North-Central	South-Central	Southern	Total
Full Seeding at Low Marine Survival:	21,700	55,000	50,000	5,400	132,100
Level #2 (75% of full seeding):	16,400	41,300	37,500	4,100	99,300
Level #1 (50% of full seeding):	10,900	27,500	25,000	2,700	66,100
38% of Level #1 (19% of full seeding):	4,100	10,500	9,500	1,000	25,100

Stock Component (Boundaries)	Full Seeding of Major Basins at Low Marine Survival (Number of Adult Spawners)				
Northern:	Nehalem	Tillamook	Nestucca	Ocean Tribs.	
(Necanicum River to Neskowin Creek)	17,500	2,000	1,800	400	
North-Central:	Siletz	Yaquina	Alsea	Siuslaw	Ocean Tribs.
(Salmon River to Siuslaw River)	4,300	7,100	15,100	22,800	5,700
South-Central:	Umpqua	Coos	Coquille	Coastal Lakes	
(Siltcoos River to Sixes River)	29,400	7,200	5,400	8,000	
Southern:	Rogue				
(Elk River to Winchuck River)	5,400				

a/ When a stock component achieves a medium or high parent spawner status under a medium or high marine survival index, but a major basin within the stock component is less than 10% of full seeding, (1) the parent spawner status will be downgraded one level to establish the allowable fishery impact rate for that component, and (2) no coho-directed harvest impacts will be allowed within that particular basin.

b/ This exploitation rate criteria applies when (1) parent spawners are less than 38% of the Level #1 rebuilding criteria, or (2) marine survival conditions are projected to be at an extreme low as in 1994-1996 (<0.0006 jack per hatchery smolt). If parent spawners decline to lower levels than observed through 1998, rates of less than 10% would be considered, recognizing that there is a limit to further bycatch reduction opportunities.

TABLE A-3. Fishery **impact** rate criteria for **OCN coho** stock components based on the harvest matrix resulting from the **OCN work group** 2000 review of Amendment 13. (Page 1 of 1).

Parent Spawner Status [a/]	Marine Survival Index (based on return of jacks per hatchery smolt)			
	Extremely Low (<0.0008)	**Low** (0.0008 to 0.0014)	**Medium** (>0.0014 to 0.0040)	**High** (>0.0040)
High Parent Spawners > 75% of full seeding	**E** ≤ 8%	**J** ≤ 15%	**O** ≤ 30%	**T** ≤ 45%
Medium Parent Spawners > 50% & ≤ 75% of full seeding	**D** ≤ 8%	**I** ≤ 15%	**N** ≤ 20%	**S** ≤ 38%
Low Parent Spawners > 19% & ≤ 50% of full seeding	**C** ≤ 8%	**H** ≤ 15%	**M** ≤ 15%	**R** ≤ 25%
Very Low Parent Spawners > 4 fish per mile & ≤ 19% of full seeding	**B** ≤ 8%	**G** ≤ 11%	**L** ≤ 11%	**Q** ≤ 11%
Critical [b/] Parental Spawners ≤ 4 fish per mile	**A** 0 - 8%	**F** 0 - 8%	**K** 0 - 8%	**P** 0 - 8%

Sub-aggregate and Basin Specific Spawner Criteria Data

Sub-aggregate	Miles of Available Spawning Habitat	100% of Full Seeding	"Critical"		Very Low, Low, Medium & High		
			4 Fish per Mile	12% of Full Seeding	19% of Full Seeding	50% of Full Seeding	75% of full Seeding
Northern	899	21,700	3,596	NA	4,123	10,850	16,275
North - Central	1,163	55,000	4,652	NA	10,450	27,500	41,250
South - Central	1,685	50,000	6,740	NA	9,500	25,000	37,500
Southern	450	5,400	NA	648	1,026	2,700	4,050
Coastwide Total	4,197	132,100	15,636		25,099	66,050	99,075

a/ Parental spawner abundance status for the OCN aggergate assumes the status of the weakest sub-aggregate.

b/ "Critical" parental spawner status is defined as 4 fish per mile for the Northern, North-Central, and South-Central subaggergates. Because the ratio of high quality spawning habitat to total spawning habitat in the Rogue River Basin differs significantly from the rest of the basins on the coast, the spawner density of 4 fish per mile does not represent "Critical" status for that basin. Instead. "Critical" status for the Rogue Basin (Southern Sub-aggergate) is estimated as 12% of full seeding of high quality

APPENDIX B
OREGON PRODUCTION INDEX DATA

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TABLE B-1. Millions of **coho smolts** [a/] released annually into the **OPI** area by geographic area and rearing agency. (Page 1 of 1)

Year or Average	Columbia River						Oregon Coast				Total OPI
		Washington						Private			
	Oregon	Early	Late	Combined	Federal	Total	ODFW[b/]	Yearlings	Total	California	
1960-1965	5.6	-	-	6.1	4.5	16.2	2.0	-	2.0	0.4	18.6
1966-1970	6.0	10.2	4.9	11.5	6.5	23.9	2.9	0.0	2.9	1.3	28.1
1971-1975	6.8	10.7	6.8	17.5	4.5	28.7	3.9	0.0	3.9	1.2	33.8
1976-1980	8.0	7.3	10.1	17.3	4.7	30.0	3.8	1.4	5.2	0.7	35.9
1981-1985	7.1	4.3	14.4	18.7	3.2	29.1	3.9	3.3	7.2	0.7	37.0
1986-1990	7.3	3.1	15.6	18.8	4.1	30.2	5.2	1.9	7.1	1.4	38.7
1991	10.4	3.7	15.3	19.0	5.9	35.3	5.3	-	5.3	1.5	42.1
1992	11.5	4.3	14.3	18.6	2.7	32.8	6.2	-	6.2	0.7	39.7
1993	11.1	4.3	14.8	19.1	4.1	34.4	4.3	-	4.3	0.8	39.5
1994	9.1	2.5	12.0	14.5	3.0	26.6	5.2	-	5.0	0.6	32.3
1995	7.1	3.4	12.9	16.3	1.7	25.2	3.7	-	3.7	0.7	29.5
1996	8.4	3.4	12.9	16.3	3.4	28.0	3.3	-	3.3	0.3	31.6
1997	6.1	3.2	7.8	11.0	3.9	21.0	2.9	-	2.9	0.7	24.6
1998	6.1	5.8	11.4	17.2	3.6	26.8	1.7	-	1.7	0.6	29.1
1999	7.6	4.0	11.5	15.5	4.8	27.9	1.0	-	1.0	0.7	29.7
2000	7.8	6.2	10.8	17.0	5.9	30.6	0.9	-	0.9	0.6	32.1
2001	7.6	4.2	9.7	13.9	3.7	25.3	0.9	-	0.9	0.6	26.8
2002	7.5	3.3	8.6	11.9	4.3	23.7	1.0	-	1.0	0.6	25.2
2003	8.2	3.3	8.7	12.0	3.1	23.3	0.8	-	0.8	0.5	24.5
2004[c/]	6.7	3.0	8.8	11.7	3.6	22.1	0.8	-	0.8	0.6	23.5

a/ Defined here as 30 fish per pound or larger and released in February or later.
b/ Beginning in 1989, does not include minor releases from STEP projects.
c/ Preliminary.

TABLE B-2. **Data** set used in **predicting 2005** Oregon production index hatchery (**OPIH**) adult coho with Stratified Random Sampling accounting. Adults and jacks shown in thousands of fish and smolts in millions of fish. (Page 1 of 1)

Year	Adult OPIH [a/]	Columbia River Jacks[b/]	Oregon Coast/California Jacks[c/]	Columbia River Smolts[d/]	Columbia River Delayed Smolts[e/]
1970	2,765.1	148.6	13.6	27.6	0.0
1971	3,365.0	172.8	6.6	24.0	0.0
1972	1,924.8	100.8	2.9	28.3	0.0
1973	1,817.0	85.7	5.7	29.9	1.8
1974	3,071.1	132.1	12.1	28.5	2.9
1975	1,652.8	75.1	1.1	27.8	1.8
1976	3,885.3	146.2	25.3	29.0	2.0
1977	987.5	46.2	7.5	28.9	0.2
1978	1,824.1	99.2	4.0	31.4	0.0
1979	1,476.7	64.1	8.4	32.6	5.0
1980	1,224.0	51.6	6.0	28.9	6.7
1981	1,064.5	40.6	8.1	28.1	5.6
1982	1,266.8	55.0	6.3	32.4	6.8
1983[f/]	599.2	61.0	7.2	27.7	5.0
1984	691.3	28.1	3.6	27.0	5.1
1985	717.5	18.2	7.8	29.2	9.1
1986	2,435.8	64.6	12.9	28.8	12.2
1987	887.2	24.2	8.7	32.9	9.0
1988	1,669.3	72.3	12.9	28.8	7.7
1989	1,720.2	55.0	5.8	29.5	7.2
1990	718.4	37.1	9.6	29.6	8.5
1991	1,874.8	60.8	7.9	30.3	7.1
1992	543.6	19.9	5.7	35.3	6.0
1993	261.7	19.6	7.5	32.8	5.5
1994	202.3	3.9	1.3	34.4	6.0
1995	147.6	9.1	2.7	26.6	3.1
1996	177.8	14.1	3.2	25.2	4.2
1997	197.6	15.8	4.6	28.0	3.4
1998	205.2	6.8	3.0	21.0	2.5
1999	335.1	22.9	5.9	26.8	3.0
2000	671.6	31.2	3.5	27.9	4.1
2001	1,415.3	71.1	15.7	30.6	2.0
2002	658.9	18.9	6.3	25.3	1.4
2003	944.8	42.2	8.1	23.7	0.3
2004	622.6	29.0	6.1	23.2	2.0
2005	389.9[g/]	21.2	4.6	22.0	0.8

TABLE B-3. Estimated **coho** salmon natural **spawner abundance** (SRS accounting) in Oregon coastal basins for each **OCN coho** management component. Estimates adjusted for visual observation bias by multiplying observed count by 1.33. (Page 1 of 1)

Component and Basin	Miles	Adjusted SRS Natural Coho Spawner Estimates															
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[h/]	2000[a/]	2001[a/]	2002[a/]	2003[a/]	2004[a/]	1990-2004 Mean
NORTHERN																	
Nehalem	386	1,552	3,975	1,268	2,265	2,007	1,463	1,057	1,173	1,190	3,713	14,285	22,310	19,088	33,059	23,930	8,822
Tillamook	249	265	3,000	261	860	652	289	661	388	271	2,175	1,983	1,883	15,262	14,584	4,584	3,141
Nestucca	167	189	728	684	401	313	1,811	519	271	169	2,201	1,171	3,940	13,068	8,929	6,093	2,699
Independent Tributaries	97	191	1,579	209	983	485	319	1,043	314	946	728	474	5,247	2,799	3,068	2,941	1,422
TOTAL	899	2,197	9,282	2,422	4,509	3,457	3,882	3,280	2,146	2,576	8,817	17,913	33,380	50,217	56,811	59,653	17,369
NORTH CENTRAL																	
Siletz	118	441	984	2,447	400	1,200	607	763	336	394	706	3,553	1,437	2,700	9,736	5,410	2,074
Yaquina	109	381	380	633	549	2,448	5,668	5,127	384	365	2,588	647	3,039	24,415	13,254	4,927	4,320
Alsea	221	1,189	1,561	7,029	1,071	1,279	681	1,637	680	213	2,050	2,465	3,339	6,260	8,957	5,769	2,945
Siuslaw	514	2,685	3,740	3,440	4,428	3,205	6,089	7,625	668	1,089	2,724	6,767	11,024	56,971	29,257	6,867	9,772
Independent Tributaries	201	895	67	1,821	1,331	1,683	560	2,975	774	1,222	3,691	817	5,636	10,733	7,682	13,945	3,589
TOTAL	1,163	5,591	6,732	15,370	7,779	9,815	13,605	18,127	2,842	3,283	11,442	14,261	25,239	102,697	66,550	36,918	22,683
SOUTH CENTRAL																	
Umpqua	1,083	3,737	3,600	2,152	9,311	4,485	11,349	9,749	2,233	8,426	6,466	10,395	32,751	34,933	26,615	27,115	12,888
Coos	208	2,273	3,813	16,545	15,284	14,685	10,351	12,128	1,127	3,167	4,945	5,386	43,301	35,429	29,559	25,933	14,928
Coquille	331	2,712	5,651	2,115	7,384	5,035	2,116	16,169	5,720	2,466	3,001	6,130	13,310	8,535	23,909	21,677	8,395
Coastal Lakes	-	4,393	7,251	1,986	10,145	5,841	11,216	13,493	8,603	11,107	12,710	12,747	19,669	22,097	16,091	18,476	11,722
TOTAL	1,622	13,115	20,315	22,798	42,124	30,046	35,032	51,539	17,683	25,166	27,122	34,658	109,031	100,994	96,174	93,201	47,933
SOUTH																	
Rogue[i/]	-	3,051	1,027	2,208	361	5,439	3,761	4,622	8,282	2,316	1,438	10,966	12,213	7,800	6,754	24,481	6,315
COASTWIDE	-	23,954	37,356	42,798	54,773	48,757	56,280	77,568	30,953	33,341	48,819	77,798	179,863	261,708	226,289	214,253	94,301

a/ Adult OPIH = Harvest impacts plus escapement for public hatchery stocks originating in the Columbia River, Oregon coastal rivers, and the Klamath River, California.
b/ Jack CR = Columbia River jack returns corrected for small adults.
c/ Jack OC = Oregon coastal and California hatchery jack returns corrected for small adults.
d/ Sm CR = Columbia River smolt release from the previous year expected to return as adults in the year listed.
e/ Sm D = Columbia River delayed smolt releases from the previous year expected to return as adults in the year listed.
f/ Data not used in subsequent predictions due to *El Niño* impacts.
g/ Preseason predicted adults.
h/ The sum of the individual basins may not equal the aggregate totals, due to the method used in removing hatchery strays.
i/ Mark recapture estimate based on seining at Huntley Park in the lower Rogue River.

TABLE B-4. **Data** set used in **predicting 2005** Oregon coastal natural river (**OCNR**) coho ocean recruits with Stratified Random Sampling (SRS) accounting. Recruits shown in thousands of fish. (Page 1 of 1)

	Recruits to Ocean			
Year	SRS	Ln SRS (Recruits)	JanAnom[a/]	UpAnom (t-1)[b/]
1970	183.1	5.21003	0.307	-16.92
1971	416.3	6.03141	-1.293	30.08
1972	185.5	5.22305	-1.393	10.08
1973	235.0	5.45959	-0.493	23.08
1974	196.4	5.28015	-0.693	47.08
1975	208.4	5.33946	-0.493	48.08
1976	451.7	6.11302	-0.893	65.08
1977	161.2	5.08265	-0.193	32.08
1978	111.6	4.71492	1.207	17.08
1979	188.8	5.24069	-1.193	-2.92
1980	108.3	4.68491	0.507	17.08
1981	174.5	5.16192	1.607	-1.92
1982	185.7	5.22413	-0.093	-8.92
1983	96.0	4.56435	1.007	14.08
1984	94.7	4.55071	0.607	-24.92
1985	124.9	4.82751	0.007	-24.92
1986	97.9	4.58395	0.107	-24.92
1987	70.1	4.24992	0.507	-39.92
1988	124.4	4.82350	-0.093	-21.92
1989	103.8	4.64247	-0.493	-43.92
1990	60.4	4.10099	-0.007	-21.92
1991	68.8	4.23120	-0.893	-37.92
1992	86.9	4.46476	0.107	43.08
1993	81.1	4.39568	-0.593	7.08
1994	40.6	3.70377	1.107	-50.92
1995	47.6	3.86283	0.707	-3.92
1996	65.5	4.18205	1.807	-1.92
1997	16.3	2.79117	0.907	9.08
1998	21.7	3.07731	2.407	-24.92
1999	37.8	3.63231	-0.393	18.08
2000	58.9	4.07584	0.107	84.08
2001	161.4	5.08389	0.707	9.08
2002	266.5	5.58537	0.207	65.08
2003	249.4	5.51906	1.107	54.08
2004	175.2	5.16593	0.407	53.08
2005	133.1[c/]	4.72125	-0.393	3.08

a/ JanAnom = The annual deviation from mean (1969-1996) January sea surface temperature (degrees Centigrade) at Charleston, Oregon.

b/ UpAnom = Annual deviation from mean (1946-1996) April-June Bakun upwelling index at 42° N latitude.

c/ Preseason adult prediction.

APPENDIX C
SALMON HARVEST ALLOCATION SCHEDULES

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HARVEST ALLOCATION -- SECTION 5.3 OF THE PACIFIC COAST SALMON PLAN

5.3 ALLOCATION

> *"Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."*
>
> *Magnuson-Stevens Act, National Standard 4*

Harvest allocation is required when the number of fish is not adequate to satisfy the perceived needs of the various fishing industry groups and communities, to divide the catch between (non-Indian) ocean and inside fisheries and among ocean fisheries, and to provide treaty Indian fishing opportunity. In allocating the resource between ocean and inside fisheries, the Council considers both inriver harvest and spawner escapement needs. The magnitude of inriver harvest is determined by the states in a variety of ways, depending upon the management area. Some levels of inriver harvests are designed to accommodate federally recognized inriver Indian fishing rights, while others are established to allow for non-Indian harvests of historic magnitudes. Several fora exist to assist this process on an annual basis. The North of Cape Falcon Forum, a state and tribal sponsored forum, convenes the pertinent parties during the Council's preseason process to determine allocation and conservation recommendations for fisheries north of Cape Falcon. The Klamath Fishery Management Council fulfills much the same roll with regard to Klamath River salmon stocks. The individual states also convene fishery industry meetings to coordinate their input to the Council.

5.3.1 Commercial (Non-Tribal) and Recreational Fisheries North of Cape Falcon

5.3.1.1 Goal, Objectives, and Priorities

Harvest allocations will be made from a total allowable ocean harvest which is maximized to the largest extent possible but still consistent with treaty obligations, state fishery needs and spawning escapement requirements, including jeopardy standards for stocks listed under the ESA. The Council shall make every effort to establish seasons and gear requirements which provide troll and recreational fleets a reasonable opportunity to catch the available harvest. These may include single-species directed fisheries with landing restrictions for other species.

The goal of allocating ocean harvest north of Cape Falcon is to achieve, to the greatest degree possible, the objectives for the commercial and recreational fisheries as follows:

- Provide recreational opportunity by maximizing the duration of the fishing season while minimizing daily and area closures and restrictions on gear and daily limits.

- Maximize the value of the commercial harvest while providing fisheries of reasonable duration.

The priorities listed below will be used to help guide establishment of the final harvest allocation while meeting the overall commercial and recreational fishery objectives.

At total allowable harvest levels up to 300,000 coho and 100,000 chinook:

- Provide coho to the recreational fishery for a late June through early September all-species season. Provide chinook to allow (1) access to coho and, if possible, (2) a minimal chinook-only fishery prior to the all-species season. Adjust days per week and/or institute area restrictions to stabilize season duration.

- Provide chinook to the troll fishery for a May and early June chinook season and provide coho to (1) meet coho hooking mortality in June where needed and (2) access a pink salmon fishery in odd years. Attempt to ensure that part of the chinook season will occur after June 1.

At total allowable harvest levels above 300,000 coho and above 100,000 chinook:

- Relax any restrictions in the recreational all-species fishery and/or extend the all-species season beyond Labor Day as coho quota allows. Provide chinook to the recreational fishery for a Memorial Day through late June chinook-only fishery. Adjust days per week to ensure continuity with the all-species season.

- Provide coho for an all-salmon troll season in late summer and/or access to a pink fishery. Leave adequate chinook from the May through June season to allow access to coho.

5.3.1.2 Allocation Schedule Between Gear Types

Initial commercial and recreational allocation will be determined by the schedule of percentages of total allowable harvest as follows:

TABLE 5-1. Initial commercial/recreational harvest allocation schedule north of Cape Falcon.

Coho			Chinook		
Harvest (thousands of fish)	Percentage[a/]		Harvest (thousands of fish)	Percentage[a/]	
	Troll	Recreational		Troll	Recreational
0-300	25	75	0-100	50	50
>300	60	40	>100-150	60	40
			>150	70	30

a/ The allocation must be calculated in additive steps when the harvest level exceeds the initial tier.

This allocation schedule should, on average, allow for meeting the specific fishery allocation priorities described above. The initial allocation may be modified annually by preseason and inseason trades to better achieve (1) the commercial and recreational fishery objectives and (2) the specific fishery allocation priorities. The final preseason allocation adopted by the Council will be expressed in terms of quotas which are neither guaranteed catches nor inflexible ceilings. Only the total ocean harvest quota is a maximum allowable catch.

To provide flexibility to meet the dynamic nature of the fisheries and to assure achievement of the allocation objectives and fishery priorities, deviations from the allocation schedule will be allowed as provided below and as described in Section 6.5.3.2 for certain selective fisheries.

1. Preseason species trades (chinook and coho) which vary from the allocation schedule may be made by the Council based upon the recommendation of the pertinent recreational and commercial SAS representatives north of Cape Falcon. The Council will compare the socioeconomic impacts of any such recommendation to those of the standard allocation schedule before adopting the allocation which best meets FMP management objectives.

2. Inseason transfers, including species trades of chinook and coho, may be permitted in either direction between recreational and commercial fishery quotas to allow for uncatchable fish in one fishery to be reallocated to the other. Fish will be deemed "uncatchable" by a respective commercial or recreational fishery only after considering all possible annual management actions to allow for their harvest which meet framework harvest management objectives, including single species or exclusive registration fisheries. Implementation of inseason transfers will require (a) consultation with the pertinent recreational and commercial SAS members and the STT and (b) a clear establishment of available fish and impacts from the transfer.

3. An exchange ratio of four coho to one chinook shall be considered a desirable guideline for preseason trades. Deviations from this guideline should be clearly justified. Inseason trades and transfers may vary to meet overall fishery objectives. (The exchange ratio of four coho to one chinook approximately equalizes the species trade in terms of average ex-vessel values of the two salmon species in the commercial fishery. It also represents an average species catch ratio in the recreational fishery.)

4. Any increase or decrease in the recreational or commercial total allowable catch (TAC), resulting from an inseason restructuring of a fishery or other inseason management action, does not require reallocation of the overall north of Cape Falcon non-Indian TAC.

5. The commercial TACs of chinook and coho derived during the preseason allocation process may be varied by major subareas (i.e., north of Leadbetter Point and south of Leadbetter Point) if there is a need to do so to decrease impacts on weak stocks. Deviations in each major subarea will generally not exceed 50% of the TAC of each species that would have been established without a geographic deviation in the distribution of the TAC. Deviation of more than 50% will be based on a conservation need to protect the weak stocks and will provide larger overall harvest for the entire fishery north of Cape Falcon than would have been possible without the deviation. In addition, the actual harvest of coho may deviate from the initial allocation as provided in Section 6.5.3.2 for certain selective fisheries.

6. The recreational TACs of chinook and coho derived during the preseason allocation process will be distributed among four major recreational port areas as described in the coho and chinook distribution sections below. Additionally, based on the recommendations of the SAS members representing the ocean sport fishery north of Cape Falcon, the Council will include criteria in its preseason salmon management recommendations to guide any inseason transfer of coho among the recreational subareas to meet recreational season duration objectives. Inseason redistributions of quotas within the recreational fishery or the distribution of allowable coho catch transfers from the commercial fishery may deviate from the preseason distribution. The Council may also deviate from subarea quotas to (1) meet recreational season objectives based on agreement of representatives of the affected ports and (2) in accordance with Section 6.5.3.2 with regard to certain selective fisheries.

5.3.1.3 Recreational Subarea Allocations

Coho

The north of Cape Falcon preseason recreational TAC of coho will be distributed to provide 50% to the area north of Leadbetter Point and 50% to the area south of Leadbetter Point. The distribution of the allocation north of Leadbetter point will vary, depending on the existence and magnitude of an inside fishery in Area 4B which is served by Neah Bay.

In years with no Area 4B fishery, the distribution of coho north of Leadbetter Point (50% of the total recreational TAC) will be divided to provide 74% to the area between Leadbetter Point and the Queets River (Westport), 5.2% to the area between Queets River and Cape Flattery (La Push), and 20.8% to the area north of the Queets River (Neah Bay). In years when there is an Area 4B (Neah Bay) fishery under state management, the allocation percentages north of Leadbetter Point will be modified to maintain more equitable fishing opportunity among the ports by decreasing the ocean harvest share for Neah Bay. This will be accomplished by adding 25% of the numerical value of the Area 4B fishery to the recreational TAC north of Leadbetter Point prior to calculating the shares for Westport and La Push. The increase to Westport and La Push will be subtracted from the Neah Bay ocean share to maintain the same total harvest allocation north of Leadbetter Point. Table 5-2 displays the resulting percentage allocation of the total recreational coho catch north of Cape Falcon among the four recreational port areas (each port area allocation will be rounded to the nearest hundred fish, with the largest quotas rounded downward if necessary to sum to the TAC).

TABLE 5-2. Percentage allocation of total allowable coho harvest among the four recreational port areas north of Cape Falcon.

Port Area	Without Area 4B Add-on	With Area 4B Add-on	
Columbia River	50.0%	50.0%	
Westport	37.0%	37.0%	plus 17.3% of the Area 4B add-on
La Push	2.6%	2.6%	plus 1.2% of the Area 4B add-on
Neah Bay	10.4%	10.4%	minus 18.5% of the Area 4B add-on

Example distributions of the recreational coho TAC north of Leadbetter Point would be as follows:

Sport TAC North of Cape Falcon	Without Area 4B Add-On				With Area 4B Add-On [a/]					
								Neah Bay		
	Columbia River	Westport	La Push	Neah Bay	Columbia River	Westport	La Push	Ocean	Add-on	Total
50,000	25,000	18,500	1,300	5,200	25,000	19,900	1,400	3,700	8,000	11,700
150,000	75,000	55,500	3,900	15,600	75,000	57,600	4,000	13,600	12,000	25,600
300,000	150,000	111,000	7,800	31,200	150,000	114,500	8,000	27,500	20,000	47,500

a/ The add-on levels are merely examples. The actual numbers in any year would depend on the particular mix of stock abundances and season determinations.

Chinook

Subarea distributions of chinook will be managed as guidelines and shall be calculated by the STT with the primary objective of achieving all-species fisheries without imposing chinook restrictions (i.e., area closures or bag limit reductions). Chinook in excess of all-species fisheries needs may be utilized by directed chinook fisheries north of Cape Falcon or by negotiating a chinook/coho trade with another fishery participant group.

Inseason management actions may be taken by NMFS Regional Director to assure that the primary objective of the chinook harvest guidelines for each of the three recreational subareas north of Cape Falcon are met. Such actions might include: closure from 0 to 3, or 0 to 6, or 3 to 200, or 5 to 200 nautical miles from shore; closure from a point extending due west from Tatoosh Island for 5 miles, then south to a point due west of Umatilla Reef Buoy, then due east to shore; closure from North Head at the Columbia River mouth north to Leadbetter Point; change species which may be landed; or other actions as prescribed in the annual regulations.

5.3.2 Commercial and Recreational Fisheries South of Cape Falcon

The allocation of allowable ocean harvest of coho salmon south of Cape Falcon has been developed to provide a more stable recreational season and increased economic benefits of the ocean salmon fisheries at varying stock abundance levels. When coupled with various recreational harvest reduction measures or the timely transfer of unused recreational allocation to the commercial fishery, the allocation schedule is designed to help secure recreational seasons extending at least from Memorial Day through Labor Day, assist in maintaining commercial markets even at relatively low stock sizes, and fully utilize available harvest. Total ocean catch of coho south of Cape Falcon will be treated as a quota to be allocated between troll and recreational fisheries as provided in Table 5-3.

(Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be accomplished during the Council's preseason process.)

TABLE 5-3. Allocation of allowable ocean harvest of coho salmon (thousands of fish) south of Cape Falcon.[a/]

Total Allowable Ocean Harvest	Recreational Allocation		Commercial Allocation	
	Number	Percentage	Number	Percentage
≤100	≤100[b/c/]	100[b/]	b/	b/
200	167[b/c/]	84[b/]	33[b/]	17[b/]
300	200	67	100	33
350	217	62	133	38
400	224	56	176	44
500	238	48	262	52
600	252	42	348	58
700	266	38	434	62
800	280	35	520	65
900	290	32	610	68
1,000	300	30	700	70
1,100	310	28	790	72
1,200	320	27	880	73
1,300	330	25	970	75
1,400	340	24	1,060	76
1,500	350	23	1,150	77
1,600	360	23	1,240	78
1,700	370	22	1,330	78
1,800	380	21	1,420	79
1,900	390	21	1,510	79
2,000	400	20	1,600	80
2,500	450	18	2,050	82
3,000	500	17	2,500	83

a/ The allocation schedule is based on the following formula: first 150,000 coho to the recreational base (this amount may be reduced as provided in footnote b); over 150,000 to 350,000 fish, share at 2:1, 0.667 to troll and 0.333 to recreational; over 350,000 to 800,000 the recreational share is 217,000 plus 14% of the available fish over 350,000; above 800,000 the recreational share is 280,000 plus 10% of the available fish over 800,000.
Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow general coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be determined in the Council's preseason process. Deviations from the allocation may also be allowed to meet jeopardy standards for ESA listed stocks (e.g., the 1998 biological opinion for California coastal coho requires no retention of coho in fisheries off California).

b/ If the commercial allocation is insufficient to meet the projected hook-and-release mortality associated with the commercial all-salmon-except-coho season, the recreational allocation will be reduced by the number needed to eliminate the deficit.

c/ When the recreational allocation is 167,000 coho or less, special allocation provisions apply to the recreational harvest distribution by geographic area (unless superseded by requirements to meet a jeopardy standard for ESA listed stocks); see text of FMP as modified by Amendment 11 allocation provisions.

The allocation schedule is designed to give sufficient coho to the recreational fishery to increase the probability of attaining no less than a Memorial Day to Labor Day season as stock sizes increase. This increased allocation means that, in many years, actual catch in the recreational fishery may fall short of its allowance. In such situations, managers will make an inseason reallocation of unneeded recreational coho to the south of Cape Falcon troll fishery. The reallocation should be structured and timed to allow the commercial fishery sufficient opportunity to harvest any available reallocation prior to September 1, while still assuring completion of the scheduled recreational season (usually near mid-September) and, in any event, the continuation of a recreational fishery through Labor Day. This reallocation process will occur no later than August 15 and will involve projecting the recreational fishery needs for the remainder of the summer season. The remaining projected recreational catch needed to extend the season to its scheduled closing date will be a harvest guideline rather than a quota. If the guideline is met prior to Labor Day, the season may be allowed to continue if further fishing is not expected to result in any significant danger of impacting the allocation of another fishery or of failing to meet an escapement goal.

The allocation schedule is also designed to assure there are sufficient coho allocated to the troll fishery at low stock levels to ensure a full chinook troll fishery. This hooking mortality allowance will have first priority within the troll allocation. If the troll allocation is insufficient for this purpose, the remaining number of coho needed for the estimated

incidental coho mortality will be deducted from the recreational share. At higher stock sizes, directed coho harvest will be allocated to the troll fishery after hooking mortality needs for chinook troll fishing have been satisfied.

The allowable harvest south of Cape Falcon may be further partitioned into subareas to meet management objectives of the FMP. Allowable harvests for subareas south of Cape Falcon will be determined by an annual blend of management considerations including:

1. abundance of contributing stocks
2. allocation considerations of concern to the Council
3. relative abundance in the fishery between chinook and coho
4. escapement goals
5. maximizing harvest potential

Troll coho quotas may be developed for subareas south of Cape Falcon consistent with the above criteria. California recreational catches of coho, including projections of the total catch to the end of the season, would be included in the recreational allocation south of Cape Falcon, but the area south of the Oregon-California border would not close when the allocation is met; except as provided below when the recreational allocation is at 167,000 or fewer fish.

When the south of Cape Falcon recreational allocation is equal to or less than 167,000 coho:

1. The recreational fisheries will be divided into two major subareas, as listed in #2 below, with independent quotas (i.e., if one quota is not achieved or is exceeded, the underage or overage will not be added to or deducted from the other quota; except as provided under #3 below).

2. The two major recreational subareas will be managed within the constraints of the following impact quotas, expressed as a percentage of the total recreational allocation (percentages based on avoiding large deviations from the historical harvest shares):

    a. Central Oregon (Cape Falcon to Humbug Mountain) - 70%

    b. South of Humbug Mountain - 30%

    In addition,

    (1) Horse Mountain to Point Arena will be managed for an impact guideline of 3 percent of the south of Cape Falcon recreational allocation, and

    (2) there will be no coho harvest constraints south of Point Arena. However, the projected harvest in this area (which averaged 1,800 coho from 1986-1990) will be included in the south of Humbug Mountain impact quota.

3. Coho quota transfers can occur on a one-for-one basis between subareas if chinook constraints preclude access to coho.

SELECTIVE FISHERY GUIDELINES -- SECTION 6.5 OF THE PACIFIC COAST SALMON PLAN

6.5 SEASONS AND QUOTAS

* * * * * * *

6.5.3 Species-Specific and Other Selective Fisheries

6.5.3.1 Guidelines

In addition to the all-species and single or limited species seasons established for the commercial and recreational fisheries, other species-limited fisheries, such as "ratio" fisheries and fisheries selective for marked or hatchery fish, may be adopted by the Council during the preseason regulatory process. In adopting such a fishery, the Council will consider the following guidelines:

1. Harvestable fish of the target species are available.

2. Harvest impacts on incidental species will not exceed allowable levels determined in the management plan.

3. Proven, documented, selective gear exists (if not, only an experimental fishery should be considered).

4. Significant wastage of incidental species will not occur or a written economic analysis demonstrates the landed value of the target species exceeds the potential landed value of the wasted species.

5. The species specific or ratio fishery will occur in an acceptable time and area where wastage can be minimized and target stocks are maximally available.

6. Implementation of selective fisheries for marked or hatchery fish must be in accordance with U.S. v. Washington stipulation and order concerning co-management and mass marking (Case No. 9213, Subproceeding No. 96-3) and any subsequent stipulations or orders of the U.S. District Court, and consistent with international objectives under the Pacific Salmon Treaty (e.g., to ensure the integrity of the coded-wire tag program).

6.5.3.2 Selective Fisheries Which May Change Allocation Percentages North of Cape Falcon

As a tool to increase management flexibility to respond to changing harvest opportunities, the Council may implement deviations from the specified port area allocations and/or gear allocations to increase harvest opportunity through fisheries that are selective for marked salmon stocks (e.g., marked hatchery salmon). The benefits of any selective fishery will vary from year to year and fishery to fishery depending on stock abundance, the mix of marked and unmarked fish, projected hook-and-release mortality rates, and public acceptance. These factors should be considered on an annual and case-by-case basis when utilizing selective fisheries. The deviations for selective fisheries are subordinate to the allocation priorities in Section 5.3.1.1 and may be allowed under the following management constraints:

1. Selective fisheries will first be considered during the months of August and/or September. However, the Council may consider selective fisheries at other times, depending on year to year circumstances identified in the preceding paragraph.

2. The total impacts within each port area or gear group on the critical natural stocks of management concern are not greater than those under the original allocation without the selective fisheries.
3. Other allocation objectives (i.e., treaty Indian, or ocean and inside allocations) are satisfied during negotiations in the North of Cape Falcon Forum.

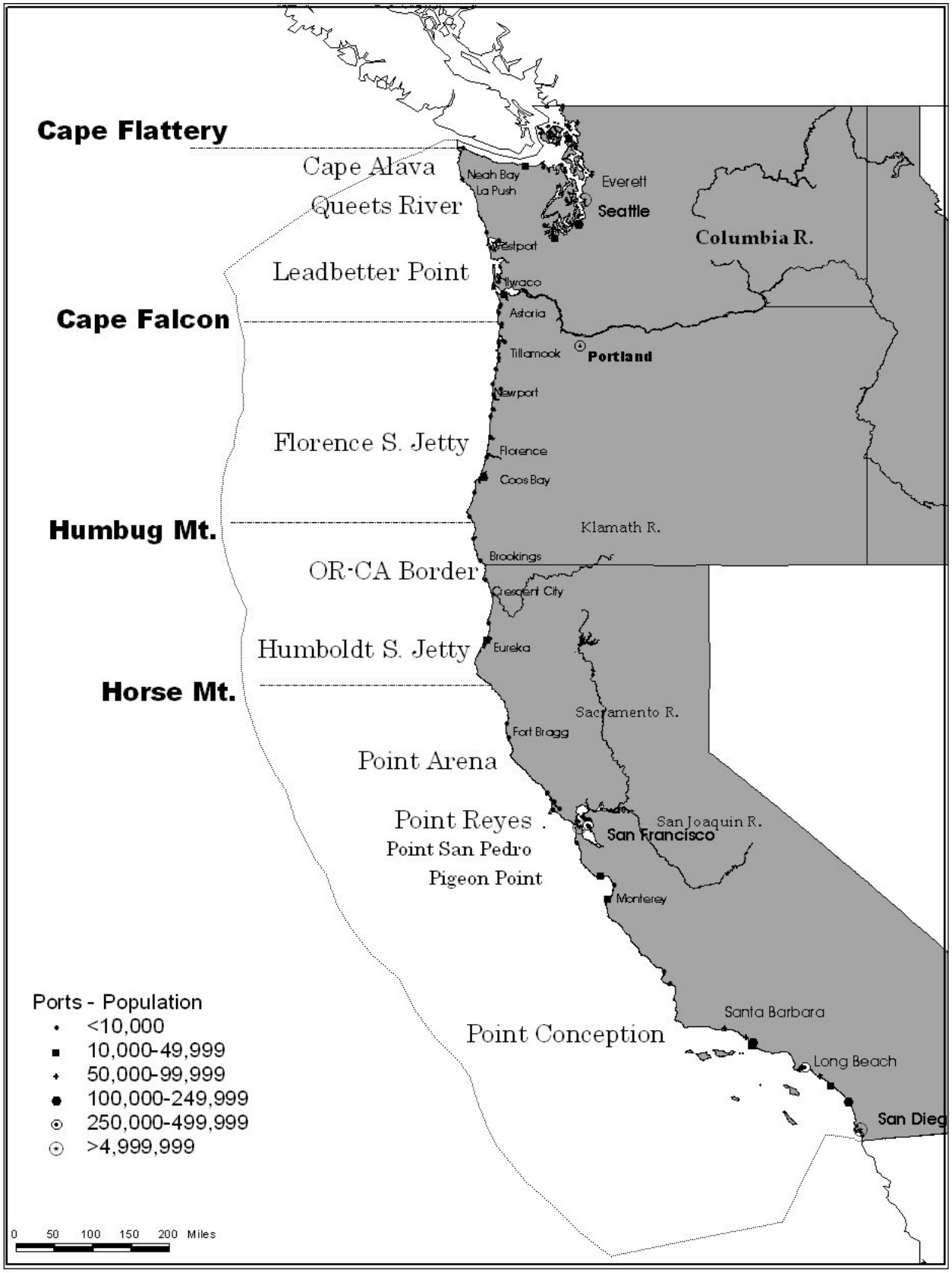
4. The selective fishery is assessed against the guidelines in Section 6.5.3.1.

5. Selective fishery proposals need to be made in a timely manner in order to allow sufficient time for analysis and public comment on the proposal before the Council finalizes its fishery recommendations.

If the Council chooses to deviate from the specified port and/or gear allocations, the process for establishing a selective fishery would be as follows:

1. Allocate the TAC among the gear groups and port areas according to the basic FMP allocation process described in Section 5.3.1 without the selective fishery.

2. Each gear group or port area may utilize the critical natural stock impacts allocated to its portion of the TAC to access additional harvestable, marked fish, over and above the harvest share established in step one, within the limits of the management constraints listed in the preceding paragraph.


Cape Flattery
Cape Alava
Queets River
Leadbetter Point
Cape Falcon
Florence S. Jetty
Humbug Mt.
OR-CA Border
Humboldt S. Jetty
Horse Mt.
Point Arena
Point Reyes
Point San Pedro
Pigeon Point
Point Conception
Neah Bay
La Push
Everett
Seattle
Columbia R.
Westport
Ilwaco
Astoria
Tillamook
Portland
Newport
Florence
Coos Bay
Klamath R.
Brookings
Crescent City
Eureka
Sacramento R.
Fort Bragg
San Joaquin R.
San Francisco
Monterey
Santa Barbara
Long Beach
San Dieg
Ports - Population
<10,000
10,000-49,999
50,000-99,999
100,000-249,999
250,000-499,999
>4,999,999
0 50 100 150 200 Miles